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Electrical Contracting

November 1928

With Which Is Incorporated

The Electragist

"Electricity's Safety Valve"

3 Parts and the Link
That's All!

SLIP ON THE LINK
INSERT IN THE CASE
PUT ON THE ONE CAP
and
THE FUSE IS READY FOR SERVICE

INSERT THE LINK
PUT ON CAP
SLIP WASHER ON
PUT ON SECOND CAP
and
THE FUSE IS READY FOR SERVICE

4 Parts and the Link
That's All!

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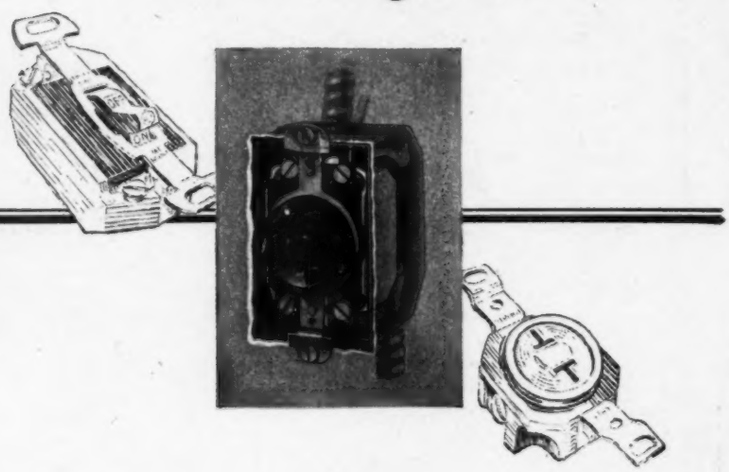
v.28 pt.1

A Switch *and* Outlet in one Unit

One Device

to mount and wire instead of two



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Please send information on Hubbell "Switch-Taps"

Name _____

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City and State _____

E. 11. 28

Electrical Contracting

With Which Is Incorporated The Electragist

S. B. WILLIAMS
Editor

Vol. 28 NOVEMBER, 1928 No. 1

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An Announcement by the Publisher

ELECTRICAL CONTRACTING, a "new" magazine, twenty-seven years old, makes its bow with this number.

In physical appearance there is little to remind one of its predecessor, The Electragist, but behind these changes is the same deep interest in the welfare and progress of the contractor that for so many years endeared the former publication to its readers.

This heritage is our most valuable asset and one that we shall continually strive to maintain.

* * *

The pictorial style which we have adopted for ELECTRICAL CONTRACTING we believe more nearly meets the needs of the present-day electrical contractor than the conventional style of publication. There is hardly any subject coming within our scope that cannot be briefly and interestingly told in pictures without sacrificing accuracy or completeness. But ELECTRICAL CONTRACTING will not be superficial. When a subject cannot be properly treated by the use of pictures alone, there will be sufficient text to do the job.

In this issue we have made but a start in carrying out our plans for a real service to contractors. It is a task of no small proportion to completely change a publication within the period of the one month between issues.

But we are making no apologies for ELECTRICAL CONTRACTING as we believe that every contractor reader will find in the feature pictorial articles, in the editorials, in the various departments and in the enlarged news section, information that is helpful and interesting and withal, an indication of the real service which can be expected from this publication month by month.

Beginning with the January number, we shall present as a regular monthly editorial feature, a complete resale price service for the contractor. This will be a compilation of suggested resale prices on all standard supplies and equipment used in electrical construction. Resale prices will be based on current jobber prices and will be revised each month.

The tremendous value of this feature will be apparent to all as there is no service that is more important than that which will aid the contractor in fairly pricing his material so that it is sold at a profit rather than at a loss.

* * *

ELECTRICAL CONTRACTING looks upon the electrical contractor as the most important man in the industry.

For many years he has been condemned as a poor business man, damned as a rotten credit risk and pitied as the victim of "impossible" conditions existing in the industry and it isn't strange, therefore, that many contractors become the victim of chronic belly-ache. But in nine cases out of ten, this is an apparent disease and not real.

The electrical contractor as we visualize him, however, is a self-respecting business man. Of course he has many perplexing problems but these cannot be solved by complaining or by price-cutting or by skimping.

John Wise, whom we introduce on the following page, is the type of man we mean. He is wise, shrewd, friendly and therefore, successful. He knows the secret of success in the contracting business and his messages month by month will furnish food for thought.

For, after all, the greatest need today is that we, in the contracting field, should change our thinking. If we think of ourselves as a group of John Wises, it won't be long before the other branches of the industry will look upon us in that light and thus will the most important of all the problems confronting the contractor be solved.

This is one of the editorial objectives of ELECTRICAL CONTRACTING, perhaps the most important activity in its program that is pledged to perform a real service for the contracting industry.

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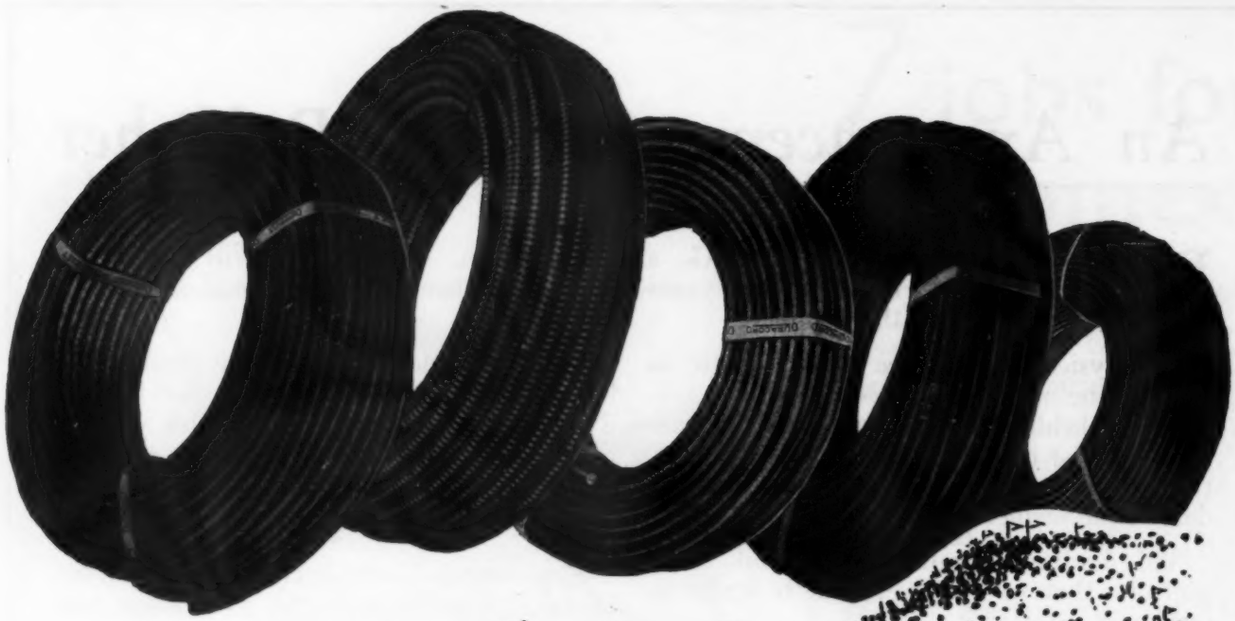

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Vol. 28
No. 1

Electrical Contracting
With Which Is Incorporated The Electragist

November
1928

Introducing Mr. John Wise

"NO—Not *Mister* Wise—leave off the 'mister'.

"I'm just plain John Wise. Work with my hands, head, jaw and feet. Keep busy—make m o n e y—make friends. Never had a bellyache in my whole life.

"I said that to a man the other day and he said *'What?—no bellyache?* Why, I thought *all* electrical contractors had bellyaches.'

"Well, you see, I've been so busy working for my customers I haven't had much time to worry about my competitors. It's been my observation that a man who really works doesn't worry, and a man who worries can't work—not with much efficiency or profit.

"And profit's what I'm in business for.

"Personally I think profit is the best bellyache medicine there is.

"When I get to looking around among the men in this business I find two kinds mostly—those that make money and friends and those that make squawkee. The fellows that make squawkee are always telling you what's the matter with the electrical contracting business. Well, what *is* the matter with the electrical contracting business? Nothing.

"Last week I met two or three alleged competitors of mine on a little job of real estater's made-to-sell houses. I landed the contract.

" 'Cheeze!' says Mr. Gottleft, you musta paid this guy money to let you do them houses. Where you gonta steal th' wire fer th' job? That's th' trouble with this business', he says, 'somebody'll always work fer nothin' just t' keep busy.'

" 'That's what I said when they showed me your bid', I snapped back. 'I told the real estater the job couldn't be done at your figure—the difference would have to come out of the job or off your wife's back or maybe out of the creditors—after they closed you up.'

" 'Then how'd *you* get it?' he said.

" 'All right, I'll tell you. When I figure on a job I always use one pencil point and one or two selling points. You use only a stub pencil point.

" 'Take this job, for example. The selling point that landed this job was the fact that I happen to know how to figure interest charges. The real estater knows his land cost, he knows in advance his building cost, but—*he doesn't know how much money he'll make on his house because he doesn't know how quick he'll sell.* It costs him interest money every day he carries that house after it's started. The faster he builds and the quicker he sells, the less interest he pays and the more profit he makes. So what he's looking for is a *quick* sale.

" 'When I went to him I said, 'Mister, you want electric wiring that will help you sell this house *quick*. For instance, here's a coat closet under the front stairs. Now, when a woman looks at a house with the idea of buying she peeks in all the closets first thing. When she comes to this closet it'll be as black as the inside of a cow. She'll have a feeling that she's looking down a cistern. As you know, a lot of sales are lost for less than that. What you want here is a switch that will automatically turn the light on and make that closet look like a sun-room the minute she opens the door. There's plenty of little tricks like that in the electrical wiring business. What I want is your permission to plan this wiring job out to *make your house sell quick*. We'll talk price later.'

" 'Yeah, but I happen to know,' said one of these also ran contractors. 'I happen to know positivel that you was cheaper. Th' real estate feller told me so.'

" 'Sure, he told you so. He may be wanting you to bid again on another house, and when he does he'll want you to bid cheap.' "

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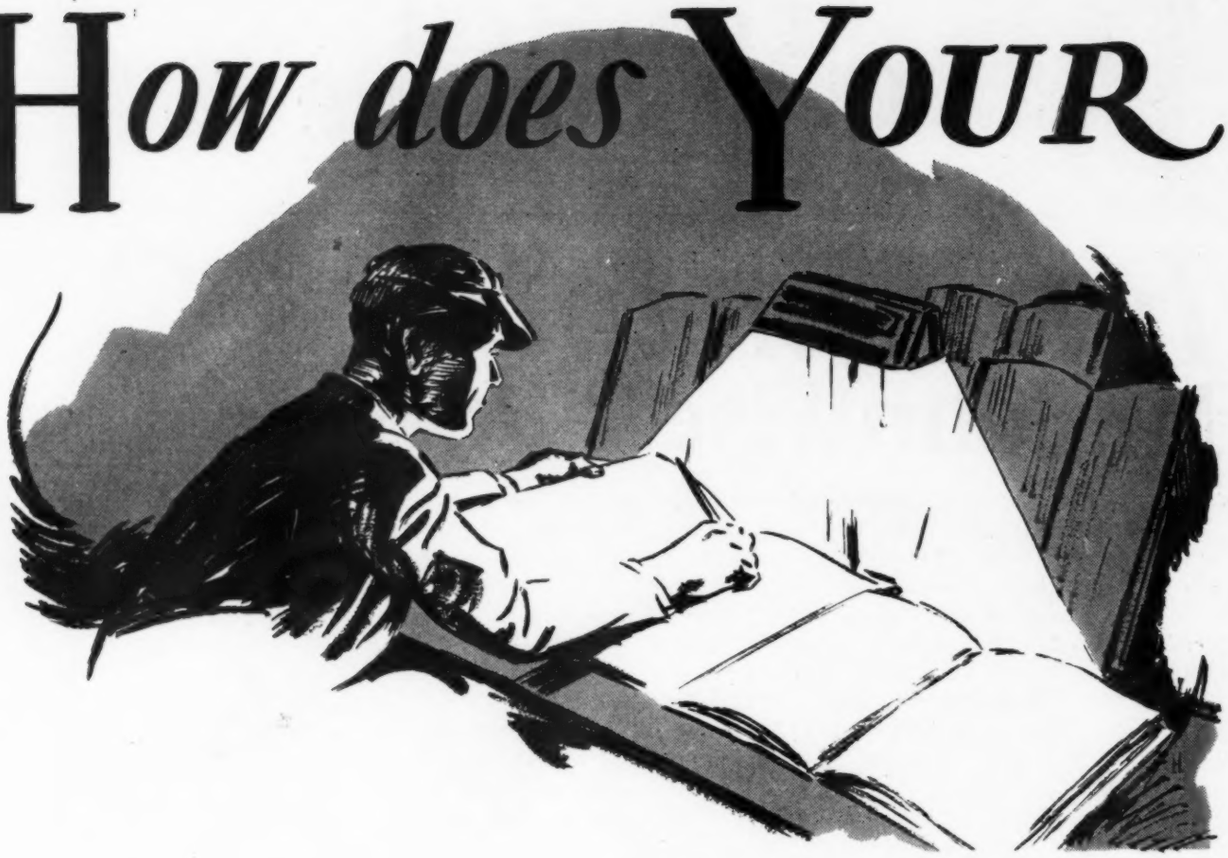
How does YOUR



Assets

	1	2	3	4	*5	6	7	8	9	10	11
Cash	3.50%	2.89%	3.64%	3.88%	6.88%	1.65%	4.58%	1.20%	6.37%	3.1	.46
Accounts and Notes Receivable (Net)	59.00	43.83	69.61	46.60	45.35	62.13	31.91	23.91	70.16	5.6	.58
Work in Process and Inventory	31.36	36.01	17.08	33.45	16.86	18.66	19.56	31.82	7.56	43.9	.48
Other Current Assets	1.16	8.56	1.60	3.54	2.62	8.33	4.61	3.06	4.07		.48
TOTAL CURRENT ASSETS	95.02%	91.29%	91.93%	87.47%	71.71%	90.77%	60.66%	59.99%	88.16%	52.7	.00%
Fixed Assets (Net)	3.92%	8.71%	6.68%	12.53%	12.34%	9.23%	39.34%	40.01%	11.84%	47.2	
Other Assets and Deferred Charges	1.06		1.39		15.95						
TOTAL ASSETS	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.0	.00%

Liabilities and Net

	1	2	3	4	5	6	7	8	9	10	11
Accounts Payable	8.10%	14.96%	26.43%	15.52%	14.49%	26.54%	27.90%	8.47%	55.29%	21.1	.74%
Bank Notes Payable	19.29	2.11	18.68	26.26	1.74	8.33	50.66	16.37		45.1	
Trade Notes and Acceptances Payable	.14	15.76	9.61	27.06		16.65		13.58		60.1	
Other Current Liabilities				.21						5.8	.92
TOTAL CURRENT LIABILITIES	27.53%	32.83%	54.72%	69.05%	16.23%	51.52%	78.56%	38.42%	55.29%	132.1	.66%
Long Time Obligations											
TOTAL LIABILITIES	27.53%	32.83%	54.72%	69.05%	16.23%	51.52%	78.56%	38.42%	55.29%	132.1	.66%
NET WORTH	72.47%	67.17%	45.28%	30.95%	83.77%	48.48%	21.44%	61.58%	44.71%	*32.1	.34%
TOTAL LIABILITIES and NET WORTH	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.0	.00%

*Indicates red

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BUSINESS Stack-up with These

How much cash should a contractor have on hand? How much of his assets should be in accounts receivable or work in progress? How much should be in fixed assets?

Likewise, what should be the condition of his accounts payable, of the notes he owes at the bank and his mortgages?

The difference between what he owns (assets) and what he owes (liabilities) is his net worth. How much should that be?

All this has been figured out for the Electrical Contractors Association of Pittsburgh by its accountants—Andrew H. Blass & Company.

These standards are given in the last column of the statements at the bottom of the page. Note that next to it are the figures for eighteen Pittsburgh electrical contractors and their average.

The standards are set up as sound practice but the facts as shown by the books are that these Pittsburgh contractors have twice as much in accounts and notes receivable as they should have. In other words they are not collecting the money due them.

It also appears that if the accounts receivable figure is too high that work in progress is low. In other words, a contractor's assets apparently cannot be in two places.

Under liabilities one would expect to find

(Continued on page 98)

Assets

10	11	12	13	14	15	16	17	18	Average for Pitts. Assn.	Standard Estab. for Assn.	
3.1	7.46	5.29%	13.80%	10.54%	21.38%	8.84%	32.98%	23.90%	10.66%	10.00%	Cash
5.6	7.58	65.24	47.00	57.42	53.04	19.12	13.36	55.26	44.22	20.00	Accounts and Notes Receivable (Net)
43.9	5.48	4.08	39.20	6.23	3.61	9.48	53.66	8.76	22.65	40.00	Work in Process and Inventory
	5.48	.50		.20		20.29			3.72	5.00	Other Current Assets
52.7	0.00%	75.11%	100.00%	74.39%	78.03%	57.73%	100.00%	87.92%	81.25%	75.00%	TOTAL CURRENT ASSETS
47.2		19.04%		21.67%	21.97%	42.27%		3.91%	16.72%	20.00%	Fixed Assets (Net)
		5.85		3.94				8.17	2.03	5.00	Other Assets and Deferred Charges
100.0	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	TOTAL ASSETS

and Net Worth

10	11	12	13	14	15	16	17	18	Average for Pitts. Assn.	Standard Estab. for Assn.	
21.1	2.74%	38.30%	21.66%	23.29%	9.12%	4.31%	10.45%	33.45%	20.11%	10.00%	Accounts Payable
45.1		13.57		12.01	13.52	5.07		9.39	13.45	10.00	Bank Notes Payable
60.1									7.94	5.00	Trade Notes and Acceptances Payable
5.8	2.92	1.47						1.48	3.44	0.00	Other Current Liabilities
132.1	5.66%	53.34%	21.66%	35.30%	22.64%	9.38%	10.45%	44.32%	44.94%	25.00%	TOTAL CURRENT LIABILITIES
						13.52%		6.38%	1.11%	10.00%	Long Time Obligations
132.1	5.66%	53.34%	21.66%	35.30%	22.64%	22.90%	10.45%	50.70%	46.05%	35.00%	TOTAL LIABILITIES
*32.1	4.34%	46.66%	78.34%	64.70%	77.36%	77.10%	89.55%	49.30%	53.95%	65.00%	NET WORTH
100.0	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	TOTAL LIABILITIES and NET WORTH

red

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A Growing Industrial

Convertor end of the convertor station with part of the switchboard. The switchboard for the installation was 96 ft. long and all copper bus connections for mains and feeders were installed and fabricated by the contractors. Approximately one hundred tons of copper were used in the installation. Part of the power (approximately one-quarter) was manufactured by the Westvaco Company, the remainder being supplied by the Appalachian Power Company at 44,000 volts.

Outside substation with the 44,000-volt main starting and running switches and the G.E. convertor transformers. Convertors were started by star-delta method on the primary side of the transformers. The contractors were informed that this was the first installation in the United States where this method of starting was employed at pressures as high as 44,000-volts. In the outside substation all bus and apparatus interconnections consisted of IPS copper tubing. Insulators were G.E. and the tower was galvanized structural steel.

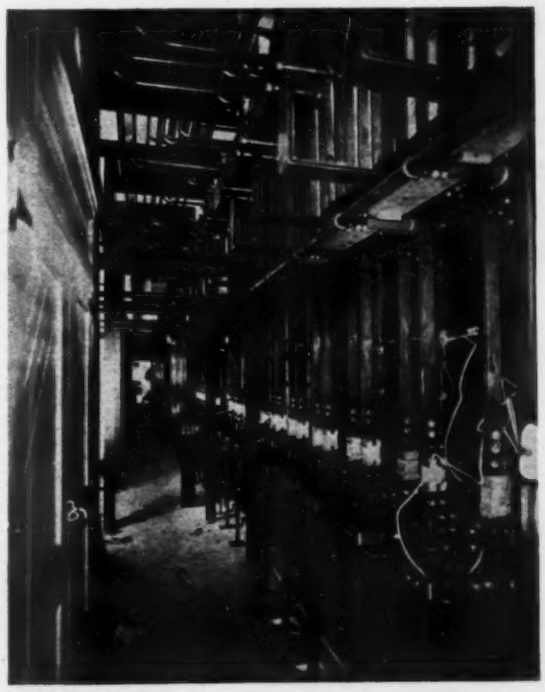
MARKET
Substation Installation

WITH the growing power requirements of industrials new problems are springing up and new opportunities unfolding for the electrical contractor. One problem that has come to the fore in the past few years is that of "service". More and more factories are buying high tension energy in bulk, stepping it down themselves and parceling it out through the several departments.

This requires a substation or transformer vault and if direct current is required, as was the case in the factory here pictured, rotaries as well. These industrial substation installations open up a rapidly growing market for contractors who are thoroughly equipped to handle this class of work.

One such installation is here pictured. It will give one an idea of the size of this kind of work in a large factory. The installation was made by The Dingle-Clark Company of Cleveland, and designed by The H. K. Ferguson Company of Cleveland, who also acted as general contractor on the project.

Main positive convertor breaker and the main positive bus, which were located on the basement floor of the station. The main positive bus consisted of eighteen (18) ¼x6 in. copper bars in the main section. Breakers are 20,000-amp. capacity each and were manufactured by the I.T.E. Circuit Breaker Company.



Rear view of the direct current end of the switchboard showing the circuit bus straps and feeder busses. Each feeder circuit was of 1000-amp. capacity and was run in solid copper rod, varying in size from 1 in. to 1⅝ in.

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Melvin Mentzer, one of Wm. H. Axelson's boys in Youngstown, O., shows how a fellow most frequently gets hurt by stepping on a nail. In the top picture he steps off the ladder to give weight to his pull on the wire. Below, the nail is shown entering his foot, while in the third view he is separating his foot from the nail in the scantling as gently as possible.

WIREMEN'S ACCIDENT RECORD

Falling from ladders, scaffolds, etc.	10%
Feet injured from stepping on nails	10%
Injuries from handling wire, conduit, etc.	10%
Injuries from using hammers	8%
Eyes injured while drilling steel	8%
Objects falling from above, such as brick	7%
Sprains of back and shoulder, etc.	7%
Cutting fingers and hands on knives, drills, etc.	7%
Slipping and tripping on floor	6%
Letting motor, pipes, and other heavy material fall on feet	5%
Injuries from testing motors, etc. and from short circuits	4%
Eyes injured while cutting concrete	3%
Washing fingers and hands on objects being handled	3%
Eyes injured from filing and threading pipe, etc.	2%
Fingers injured with screw driver	2%
Eyes injured in using emery wheel	1%
Eyes injured in using solder	1%
Injuries from falling down elevator shafts and joint ways	1%
Fingers injured from slipping wrench	1%
Bumping and walking into stationary objects	1%
Drills breaking	1%
Injured by fellow workmen	1%

Stepping on Nails Causes 10% *of* WIREMEN'S ACCIDENTS

STEPPING on nails shares with broken ladders and handling wire and conduit the honor of being the greatest contributor to wiremen's accidents. Each of these accounts every year for 10 per cent of the accidents suffered by this class of workers.

It is the frequency of such accidents that brings the higher employee casualty and liability insurance rates.

Not only do employers have to pay for this insurance, but every time one of their men has an accident, such as is pictured here, they must make out a complete report. To do so takes time and time costs money. One contractor figured that every accident to one of his men cost him $5.50 just to make out the reports.

UMI

STOP WASTING *this Man's* TIME!

by

¶ Letting him use dull and broken tools

¶Providing insufficient plans

¶ Giving him work he is unqualified to do

By A. M. COVER
Pittsburgh, Pa.

AMONG the easily controlled causes of labor waste on an electrical construction job, three very important ones are: Wastes resulting from poor tools, wastes from poor plans, and wastes from poor selection of men for crews. An efficient and profitable job is impossible when these causes of waste are ignored, yet they can be corrected by proper job management.

One method of reducing the amount of labor on a construction job, or at least of keeping within the estimated amount of labor cost, is to decrease the waste of labor caused by poor or inefficient tools. This includes the time lost by men because of dull tools, broken tools, and insufficient number of proper tools.

Among the losses from dull tools are those resulting from dull hacksaw blades and dull dies. A considerable amount of time can be saved on any job if these tools are kept sharp. Tests have shown that a dull hacksaw blade takes so much longer to cut a pipe, that the additional time used by a workman, even though he be a low paid helper, is far greater than the cost

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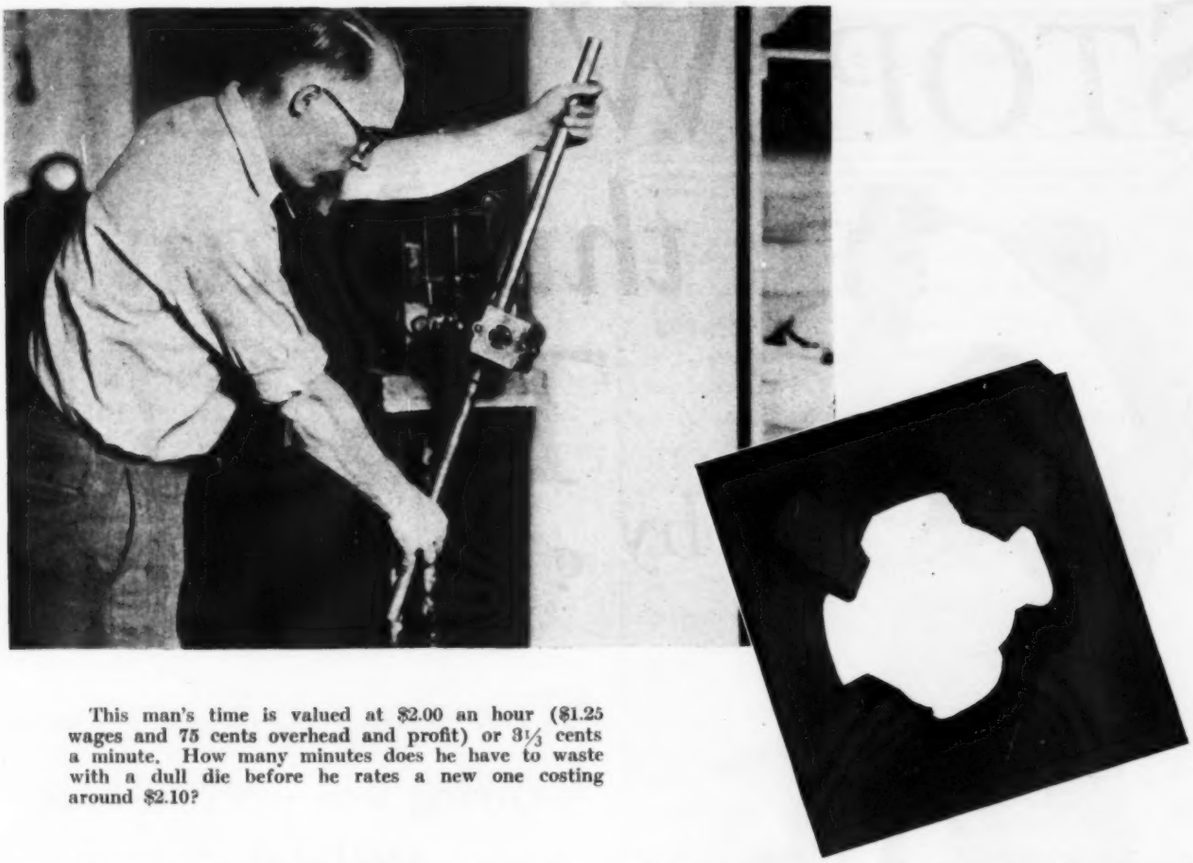


This man's time is valued at $2.00 an hour ($1.25 wages and 75 cents overhead and profit) or 3⅓ cents a minute. How many minutes does he have to waste with a dull die before he rates a new one costing around $2.10?

of a new blade. Further, in the workman's effort to increase the speed of the blade he begins to put pressure on the saw and it breaks and must be replaced.

It takes much longer to thread pipe if the die is dull, and usually results in poor threads that must be recut.

A broken handle on a hammer or sledge will waste time as well as being a liability to the workman's health. Some workmen will spend costly time trying to drive out the old piece of handle in order to fit in a new one; or they will try to work with the broken handle with the result that their efficiency is reduced as much as 75 per cent. Moreover, they are likely to run slivers in their hands and waste still further time.

The job superintendent or foreman is the man who should be held responsible for all tools used on the job. When the job is started he should requisition all tools that he needs and they should be sent him in good condition, either from the stock room or from another job. If they are sent from the stock room they should be in good condition, or else they should not be sent out; if they are transferred directly from some other job, the superintendent should take the time to go over all the tools carefully and return to the shop all defective or worn and dull tools.

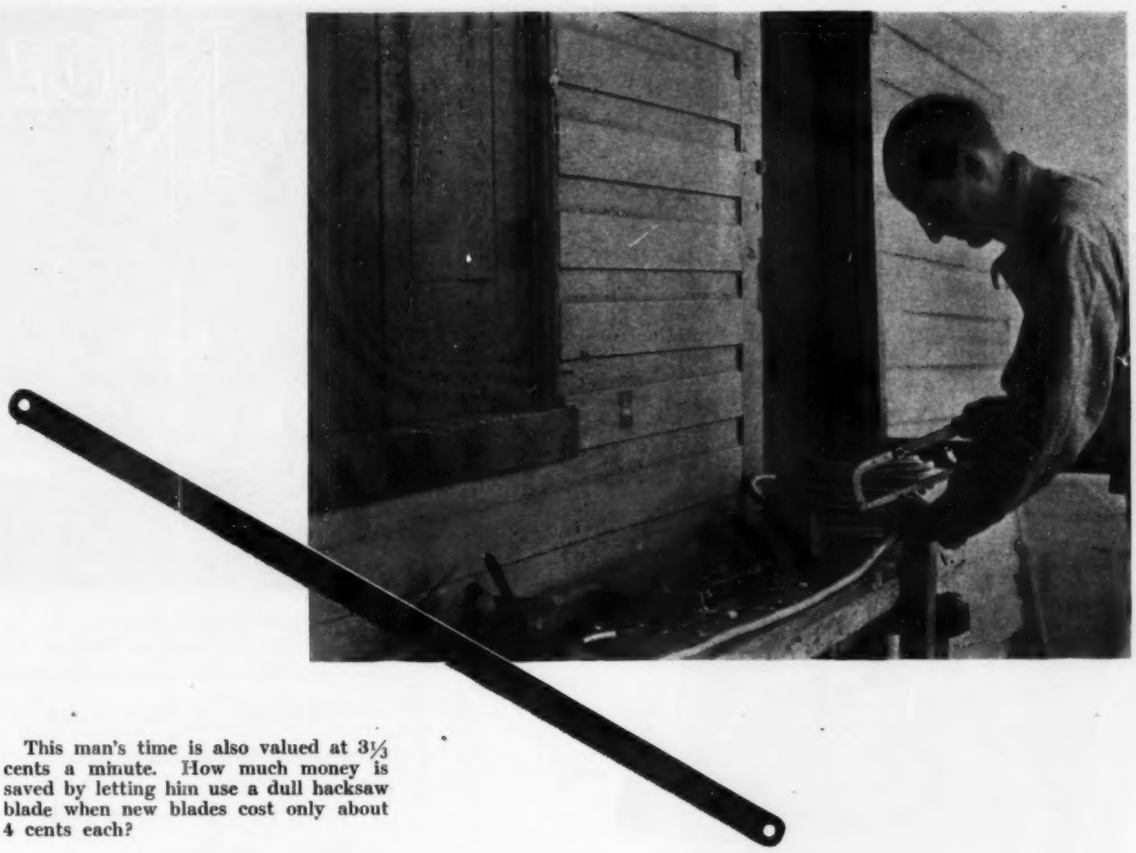
When tools have broken handles or look weak they should be returned for repair; a sufficient quantity of surplus tools should be kept on the job so that no workmen will have to wait while an order is sent to the shop and new tools brought out.

To try to save money by skimping either on quality, condition or quantity of tools, is to lose money in the end. One man waiting half an hour for a tool may waste more time than the cost of the tool. An efficient construction job is so planned that it will go along from start to finish with every workman busy all of the time. Anything that happens to delay the workmen will result in the job taking longer than expected and more labor cost will be required than estimated.

Careful records, of course, should be kept of all tools as they are requisitioned for any job or returned to the shop. If possible, tests should be made on various brands of tools to see which are the most efficient in amount of work which can be accomplished with them, and in their length of life. Special tools, such as power saws, power cutters and threaders should be carefully recorded on cards in the office and warehouse, so that the stockman can learn from the file at any time just where the machine is, what work it has done, and in what condition it was when sent out.

Poor Layouts

Another great cause of labor waste on a job is a poor engineering layout. A layout which requires much study by the foreman is a wasteful layout because often men have to wait around doing nothing while the foreman puzzles his way through the plans. Only about one out of three architect's drawings can be followed directly; all the others must be redrawn. If the architect's drawings are used, the electrical layout should be penciled in in colors, with a different color for different sizes of pipe.



This man's time is also valued at 3⅓ cents a minute. How much money is saved by letting him use a dull hacksaw blade when new blades cost only about 4 cents each?

If, however, the architect's drawing is too complicated or incomplete to use, the contractor's engineering department should make a layout with nothing on it but the electrical work. If the plumbing and steam layout is shown, taken from the plans of the building, the foreman will find ninety-nine times out of a hundred, that the steam and plumbing pipes are installed differently than would be expected from the plans. If just the electrical work is shown, the foreman on the job can make such minor changes as are necessary when he sees just where the other pipes are. An engineering layout devoted exclusively to the electrical work saves the foreman considerable time in tracing the connections, and the exact place where the conduits are laid depends on the particular circumstances of the building itself.

Even on a small job where the layout is fairly simple, the engineering department can save a good amount of time on the job by making a rough pencil layout with different colors for the different sizes of pipe. This takes some time of a man in the office but saves the time of the foreman and workmen on the job.

The Right Workmen

Another great saving in labor can be effected by using good judgment in selecting the workmen for different classes of work. Some men can do one kind of work better than another, and they usually do the work faster and better, owing to being better fitted to that class of work. In work that is done by crews, some very great savings in time can be made by using the crews on the same type of work as much as possible. Certain workmen may do a considerable amount of work on large pipe, while another workman may be efficient only on small pipe. If the two crews are turned around, both kinds of work will be installed much slower and not always correctly, but if the crews are always used on their special type of installation, the job will go along much faster, and will require less supervision.

One of the most difficult jobs in installation work is substation transformer vaults and high tension work. The men doing this class of work can become very efficient at it, but unless the men are used to sub-station work they will be so slow and inaccurate that the contractor will lose money and often the good will of his customer. Substation vaults differ so greatly from each other that an inexperienced crew would be like a new child in school; willing but unable to proceed without teaching or excess supervision.

The efficient superintendent will try to arrange his jobs so that a specialized crew can go from job to job without delay, keeping on the same kind of work all the time.

This is one of the most difficult problems of labor management, because it is hard to find new specialists when you want them and equally difficult, sometimes, to keep far enough ahead of a special crew so that they can be kept continuously busy.

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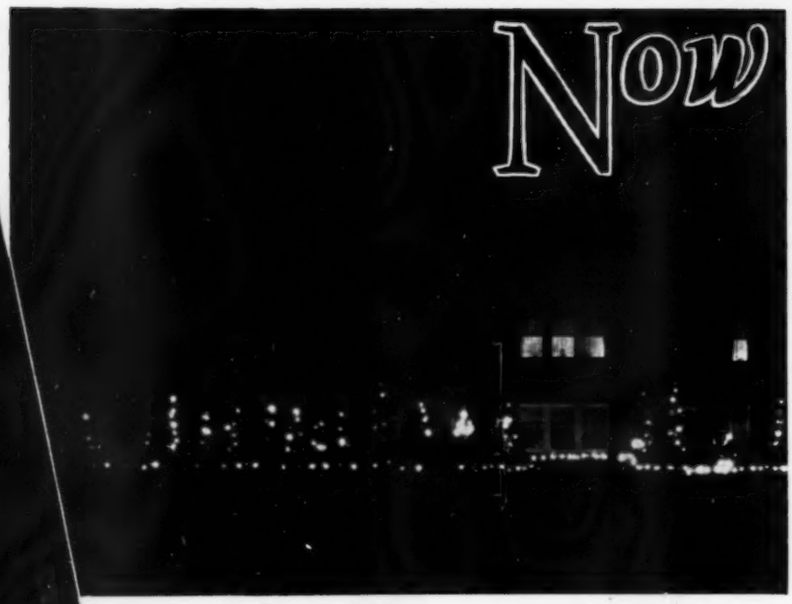
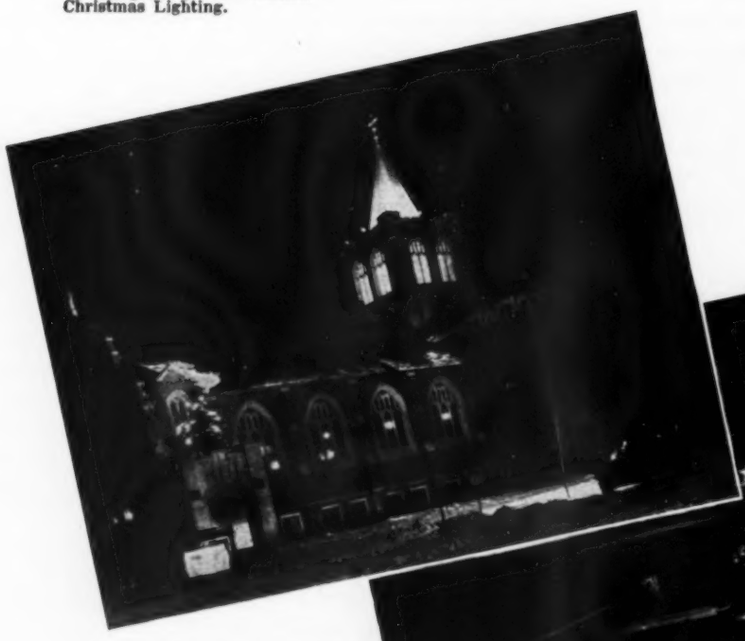
Where a Border of Flowers Grew Last Summer Blossoms of Light Now Shine



The Community Tree Was the Beginning of Outdoor Christmas Lighting.

TWELVE SUGGESTIONS

1. Lighted Evergreens
2. Lighted Shrubs
3. Porch Decorating with Light
4. Illuminated Stars
5. "Merry Christmas" Electric Signs
6. Illuminated Wreaths
7. Electric Candles at Windows
8. Flood Lighting Homes
9. Flood Lighting Church Steeples
10. Outlining Business Buildings
11. Special Altar Lighting
12. Community Trees



Since Christmas Eve and Chimes are Inseparable, why not Floodlight the Church Steeple?

A "Merry Christmas" Transparency Over the Front Door.

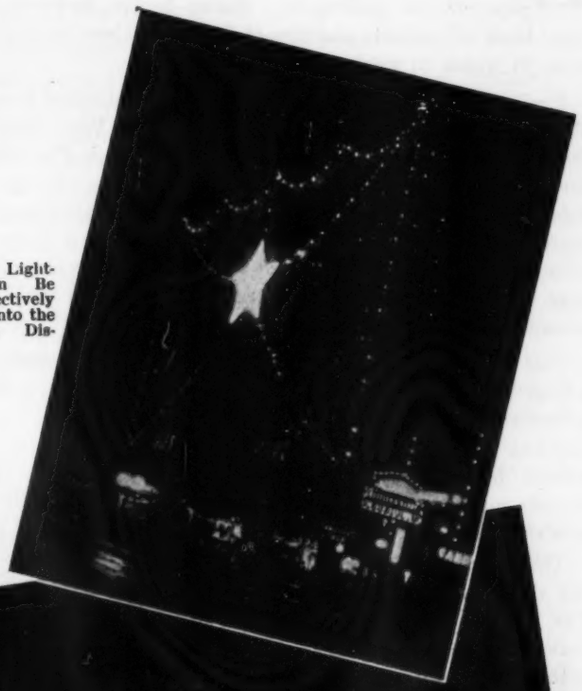
is the Time to Think About Christmas Lighting

ONLY seven weeks away is Christmas, and what has been done to stir up interest in outdoor holiday lighting?

This is essentially a league activity because of the public education required. Nevertheless the idea has spread so throughout the country that individual contractors can reap a harvest by starting now to interest former customers and prospects in outdoor convenience outlets and plans for Christmas outdoor display lighting.

This year The Society for Electrical Development, to encourage more outdoor Christmas lighting of homes, is offering $1,400 in prizes for winning displays. The country has been divided into eleven districts, to each of which is allotted a first, second, third and fourth prize of $50.00, $25.00, $15.00 and $10.00, respectively. In addition there will be a first and second prize of $200.00 and $100.00 for the two outstanding displays among the divisional prize winners.

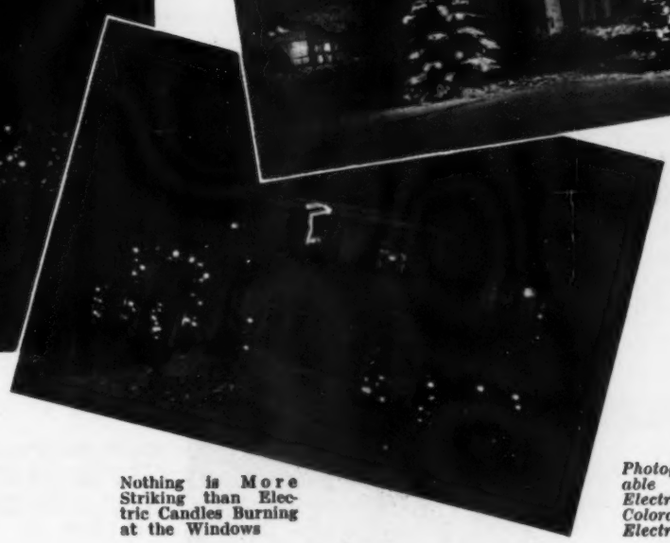
Those interested in promoting such a local activity can secure from The Society for Electrical Development, 420 Lexington Ave., New York City, complete details of the plan as well as a portfolio of suggestions, posters, publicity and radio talks.



Holiday Lighting Can Be Very Effectively Carried into the Shopping District

Illuminated Evergreens are Always Effective

The Christmas Star Hovers Over the Home with a Flagpole



Nothing is More Striking than Electric Candles Burning at the Windows

Photographs made available through courtesy Electrical League of Colorado and Noma Electric Corporation.

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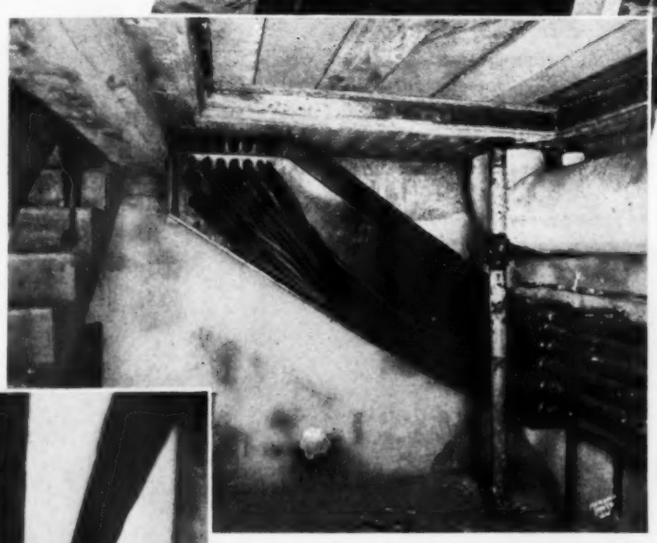
PULL BOXES
Use 50% Less Labor than Difficult Bends

LONG easy bends in conduit are not difficult nor are they extremely expensive in labor either for handling the pipe or for pulling-in. Sharp bends, however, in a large bank of conduits and especially where there is very little room in which to work, take a lot of labor.

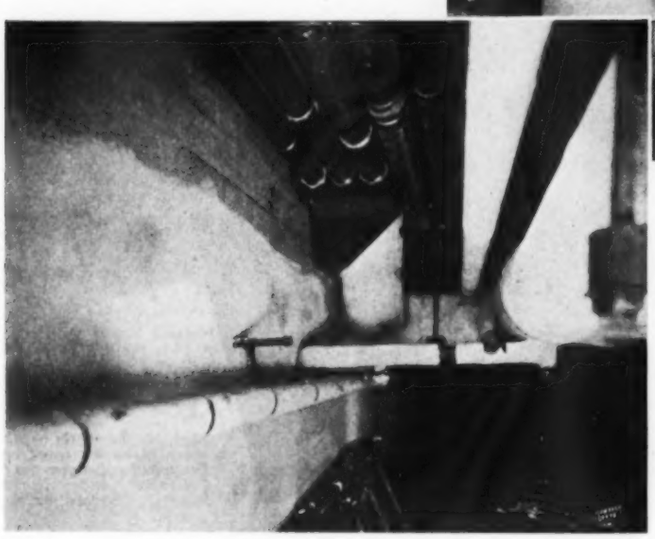
Under such conditions pull boxes offer a decided economy. The Magan Electric Company of Milwaukee, Wis., which did the Central Continuation School job on which the pictures here shown were taken, find, according to B. A. Edwards, their estimator, that by using No. 10 steel and having boxes built according to drawings there is little or no difference in material cost between pull boxes and pipe. The labor cost, however, shows about a 50% saving in favor of pull boxes.

Pull boxes also show an economy over conduit where a large number of pipes are bunched together for very short runs. This latter happens frequently where there is a control board for a large number of circuits going in the same direction, as in a theatre.

This economy of pull boxes is causing them to be used more and more. The makers of the National Electrical Code are somewhat concerned over the practice because in a few instances recently, they caused some very costly fires. Some contractors use fire-proof separators between the conductors of the several conduits to prevent total breakdown of service.



Vertical Box Carries Conductors from Contact Board to Contact Panel on Floor Above. Behind board are horizontal boxes carrying circuits to dimmers and emergency panel.



This Box Showed Great Saving. With the number of pipe entrances shown and the number of bends and change in direction it is apparent that conduit under these circumstances would have been very costly.

Use of Box Where Conduit Has Been Cut: After conductors had been pulled in it was found that a steam pipe had to come down right through middle of run. The run was cut, pull box inserted as shown and the conductors laid in it and spliced—Cost $75.00.

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Code Chats

A Monthly Discussion of Wiring Practice and Questions of Interpretation, Presented with a View Toward Encouraging a Better Understanding of the National Electrical Code - - - -

Conducted by F. N. M. SQUIRES
Assistant Chief Inspector, N. Y. Board of Fire Underwriters

Now Only One Service to a Building

In the past, some inspection departments have ruled that the Code prohibited that a building be supplied by more than one service. But a careful consideration of the Codes of the last few years failed to disclose any provision as to the number of services which might supply current to one building.

In the 1928 edition, however, in rule 401-c, this is very definitely covered:

401-c—No building shall be supplied from the same exterior distribution system through more than one set of service conductors, unless a separate service is required for fire pumps, or for emergency lights, as required by Section 3902, or unless capacity or emergency requirements make multiple services desirable, or unless there are different transformers or sets of multiphase transformers.

That seems like a lot of "unlesses" but they don't let so very much in at that. Anyway, we are glad to have a definite ruling on the matter.

* * *

Single or Multiple Service Switch

Rule 404-c (4), 1928 Code allows the omission of the single (or master) service switch in a two, three or four meter installation if the meters are grouped at the service entrance. This does not, of course, prohibit the use of the master switch but provides (404-d) that it need not be externally operable and also allows that it be omitted entirely.

Further more the service wires must be run through to the last meter. However, taps may be taken off at the intermediate meters but the rule fails to specify what size conductor is to be used for the taps. Should they be the same size as the service run, or only large enough to supply the current required by the individual meter?

In as much as these taps are unprotected by cutouts and as they are required to be quite short (i. e. "grouped at the point of entrance") it does not seem that conductors smaller than the service wires should be used especially since the economy of using smaller wires would be negligable.

* * *

The Neutral and the New Demand Factor

The following question has been asked:

"New Code (1928) 613-e.

"The size of the neutral and the demand applying thereto shall be determined as specified in the previous paragraphs.

"I take this to mean that for an ordinary 3-wire feeder, 110-220 volt D. C. or single-phase, the neutral not being combined with the neutral of any other feeder, the neutral must be the same size as the outside wires, determined on the basis of demand and carrying capacity. In other words, the rule quoted above has universal application, regardless of whether neutrals are combined or not. Is this correct?"

Yes, the neutral should be of the same size as the outside conductors as it may be subjected to the same load if one side of the system became disconnected. And, the neutral is still to be of sufficient capacity to carry the maximum current to which it may be subjected and this capacity is to be determined by the provisions of 613.

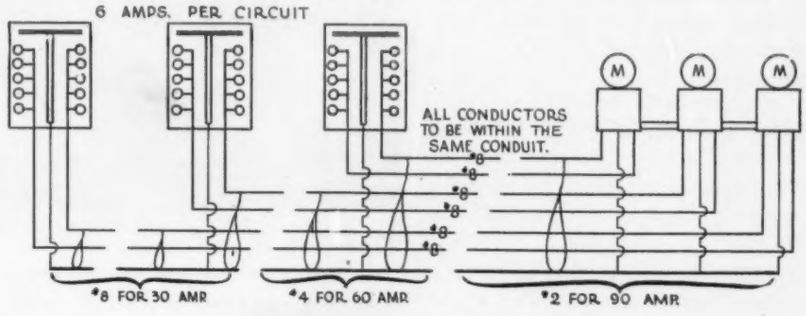
If, then, two or more neutrals are to be combined, the conductor which is subjected to the combined load must be increased in capacity sufficiently to carry the load. When this load exceeds 200 amp., then the demand factor of 613-e may be applied.

For the sake of illustration let us assume the following conditions: Single-phase, 3 wire system. Three 10 circuit panel boards each supplied by a different meter at the service. Calculated load of 6 amp. per circuit.

Note that the size of the common neutral increases as the load to which it may be subjected increases; also that all wires must be within the same armor.

In the case of 2-wire final circuits run from a meter bank to individual apartments, eight circuits may be served by a common neutral and balanced across a 3-wire D. C. or single-phase system. Of course, all of these wires must be within the same conduit or armor because of induction difficulties and the number is limited to eight, as nine is the largest number of wires allowed in one conduit.

But we notice that the rule gives the benefit of the maximum number of wires allowed in one conduit in the case of 2- or 3-wire circuits and also with 5-wire 2-phase systems, but does not allow that with 3-wire feeders nor with 4-wire, 3-phase systems.



Common Neutral Increases with Load

Use of White or Gray Wire

The 1925 Code required that the grounded conductor be identified by means of a white or natural gray covering but did not prohibit the use of such a wire anywhere else and a good many equipments have been installed with all white covered wire.

Now, however, the 1928 Code plainly forbids the use of the white wire except for the grounded wire:

500-h—Wires having white or natural gray covering shall not be used in identified systems or circuits except as conductors for which identification is required by this section.

And in the fine print notes following this rule are explained ways in which switches should be wired. It would be advisable to digest these notes very thoroughly.

* * *

Fine Print Notes

As a rule fine print notes appearing in the Code are not taken very seriously. Probably that is because they are understood to be merely recommendations and not requirements. Attention should, however, be paid to them as they were inserted in the Code for very good and sufficient reasons. In general they are important adjuncts to the Code and very often are fore-runners of requirements which will appear in future Codes.

With this in mind, we quote the fifth fine-print note under the introduction to Article 2—General.

"It is elsewhere provided in this Code that the number of wires and circuits confined in a single enclosure be varyingly restricted. It is strongly recommended that architects and others provide similar restrictions wherever practicable, to the end that the effects of breakdowns from short-circuits or grounds, even though resulting fire and similar damage is confined to wires, their insulation and enclosures, may not involve entire services to premises nor interruptions of essential and independent services."

As we all know the number of wires contained within one wireway (surface raceway, conduit, underfloor duct, etc.) is limited to nine or ten, and this note, which was the result of considerable agitation for a rule, is the forerunner of a rule to put restrictions on other places in which wires may be grouped; viz., in junction, pull or splice boxes.

Here, frequently, we find hazardous conditions due to crowding of wires and splices where a fire due to the short circuit of a single circuit or the failure of a single splice would result in the interruption of a large number of circuits instead of but a few.

A contractor who takes pride in the performance of his work will heed these suggestions and try out a few installations and profit by this. Then when the Code makes requirements of this kind he will have had experience in it and will know how to do it.

* * *

External Operability of Service Switches

Quite a bit of discussion has arisen over rule 405-d (1928) which reads as follows:

A service switch shall be enclosed and externally operable unless made inaccessible to other than qualified persons. A service switch shall be readily accessible and externally operable unless additional switches are provided for control of all individual feeders and circuits supplied through it, as recommended below.

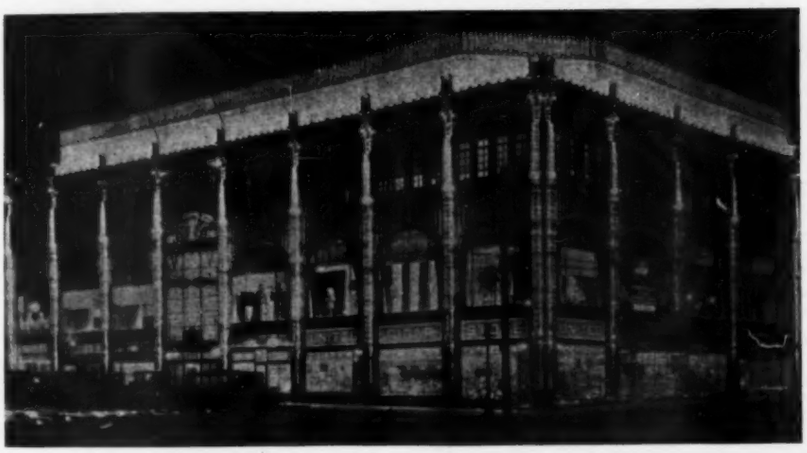
This says, then, that the service switch shall be enclosed and externally operable unless made inaccessible to other than qualified persons and then goes on to say that it must not only be not inaccessible, but must be *readily* accessible except for certain other conditions. I believe the intention was to make it always readily accessible except in such a class of occupancy as requires that it be under constant and competent supervision. For instance, in certain classes of business the entire equipment would be at all times under the constant attention of a competent engineer or other qualified person. In such a place the attendant is always ready in time of emergency and it would not be necessary and perhaps not advisable for the service switch to be accessible to everybody and anybody.

The second sentence of 404-d takes into consideration the fact that additional switches for the control of individual circuits are always located so as to be accessible (as required in 1202) in which case the service switch need not be externally operable.

Also this second sentence should be taken into consideration in connection with 404-c (4). I believe the intent was to allow the single service switch to be not externally operable and to even be omitted entirely if there are only two, three or four meters each provided with individual meter switches that are externally operable.

Another point questioned was whether or not a lighting company's seal rendered a service switch inaccessible. It does not seem that this interpretation should be held as these seals are made so as to be readily broken in case of emergency and no public utility would be apt to take offense if one of their seals were broken in a time of emergency. Therefore, the placing of a seal on the service cabinet should not be sufficient excuse for allowing the omission of the externally operable feature of the switch.

Most Beautifully Illuminated Building in America



The John H. McClatchey building, Philadelphia, which was opened September 20 was characterized by Merritt Huse, president of the Illuminating Engineering Society as "The most beautifully illuminated business building in America."

The pilasters are of art glass and are illuminated by means of 60-watt lamps and reflectors concealed within. At the top of each pier is a 250-watt projector throwing a beam upwards, thus tying the upper and lower structure together. The fourth story is illuminated by thirty changes in colored light repeated every ten minutes. The lighting units were supplied by the Pittsburgh Reflector Company.

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WATCH *Safety & Convenience* *in* FARM WIRING

THE farm is not only a home, it is a business as well. Therefore, the contractor is charged with the responsibility of not only seeing that the wiring is safely installed but conveniently as well.

If a fire breaks out in the country the farmer loses, as a rule, not only his home but also his source of livelihood—his investment. His wiring must be as safe from fire as possible.

Farms do not have "city water," the piping for which provides a good ground. Therefore, a ground must be provided, generally driven, one at house and one at the barn. Because of damp conditions great care should be exercised to make the best ground possible.

Electricity is used about the farm because of its convenience and time saving and for that reason contractors are urged to make all switches and outlets readily accessible. Place outlets in such a way that as far as possible long runs of flexible cord are eliminated.

The photographs here shown were taken on the farm of James K. Jones, Fond du Lac, Wis.

Above—Entrance at Barn. The 110-volt conductors with grounded neutral are brought over from the house, where service entrance switch is located, and carried down in conduit to pump house, with yard light tapped off as shown. All wiring in barn is in conduit.

Below—Interior of Pump House. Circuit enters through conduit as shown in upper center and is carried across and down to the 30-amp. barn entrance switch shown at the left and grounded through concrete floor. In the center is the distributing cabinet for the barn and at the right a 30-amp. pump switch. Lighting for the pump house is by means of a large lamp in the outlet over the door, which is being temporarily used for the photographer's 1000-watt lamp. Notice toggle switch at the door is up high to be out of way of cattle.

Center—Meter service in Basement of Jones Farm House: At the left is a 60-amp. meter service switch, the ground being driven through the concrete basement floor. Ordinarily the grounding is done outside. This is the safety meter testing type of switch, a new and very modern departure for farm installations. Next comes the 60-amp. range switch, followed by the 60-amp. barn switch. At the right is the 10 by 10 in. fuse cabinet for the two house circuits. This is standard equipment in this locality—safe and convenient. Circuits through the basement carried through conduit as shown.

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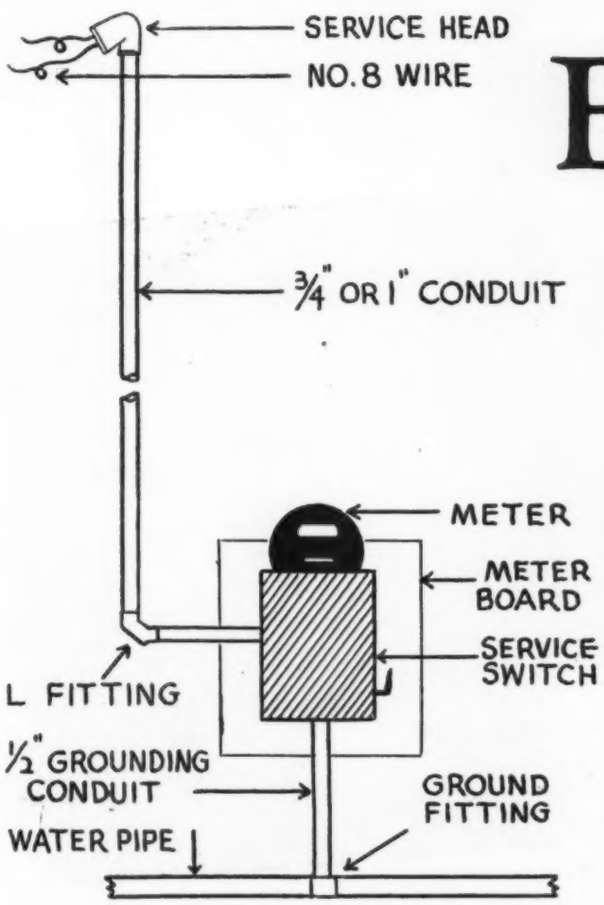
ESTIMATING METHODS XVI

Estimating for SERVICE ENTRANCES

By
A. L. ABBOTT, Formerly
Technical Director, Association of Electragists



THE time-honored method of estimating house wiring is to use a set figure "per outlet" to include everything on the job. Even across the Atlantic this method seems to be in vogue, for in the English trade papers we find the practice mentioned of charging "a pound a point," "point" being British for outlet.

It is easy to show that this widely used method is far too rough an approximation to be considered satisfactory. A careful investigation was made recently of the costs of house wiring with armored cable in a city in New York and average unit costs were found. Applying these average costs to two actual installations, the cost on a 62 outlet job was $1.66 per outlet and on a 31 outlet job $1.88 per outlet. Going still further, if the number of outlets is reduced to 19 the cost will be $2.07 per outlet. These are not by any means extreme cases; jobs could easily be found which would show a still wider variation.

The reasons for these variations in the total cost per outlet are: First, varying proportion of switches and convenience outlets to lighting outlets, and second, the fact that within a certain range the service remains unchanged

regardless of the number of outlets and has a fixed cost.

It would of course be possible to follow the standard method used for estimating other types of wiring installations, that is, prepare a set of plans showing the complete layout, scale off the length of wire, cable or conduit with a rotometer, make up a complete list of material and compute the labor by applying suitable labor units to the material items. This is the right method to use for unusually large houses, for averages cannot well be applied to this class of work; but for common houses up to a 10 or 12 room size it is impracticable to make estimates in this way because it involves too high an overhead charge. Even if all estimating costs could be included in the selling prices it would be an economic waste to spend so much money on estimating.

A practical and accurate method of estimating is provided by working out the cost of each kind of outlet and the complete cost of each of the three or four types of services commonly installed.

The outlet costs should include all branch circuit wiring from the meter service switch, cutout box or cabinet to the outlets, and all outlet equipment such as switches, receptacles at convenience outlets, etc. A separate figure must be computed for each kind of outlet which, either by reason of its location or equipment, has a cost different from that of other outlets. The varieties which usually must be listed are as follows:

Light outlets in basement.
Light outlets (ceiling or bracket) above basement but not including a single outlet in the attic.
A single light outlet in the attic.
Convenience outlets.
Single-pole switches.
Single-pole switch and pilot light combination for control of basement outlets.
3-point switches.
4-point switches.

The general term "service" is used here as including the service conduit and wire, grounding wire and conduit for same if used, the service switch, and cutouts and box or panelboard and cabinet, also all connections required by this apparatus. The number of different types of services for which costs must be worked out will depend upon local requirements.

According to the 1928 National Electrical Code, if no provision is made for a range or any other appliance consuming a considerable amount of power, two No. 8 service conductors will carry the load in a single-family residence having a floor area not exceeding 3420 sq. ft. Under the same conditions a 3-wire No. 8 service is permitted for a residence having not over 9830 sq. ft. of floor area. In computing the areas, the outside dimensions of the building are used, and unfinished attics, open porches and unfinished spaces in the basement are neglected. Assuming in each case a two-story house having no finished rooms in the attic or basement, two No. 8 service wires will carry a house measuring 40 ft. by 40½ ft., and three No. 8 wires are large enough for a house 50 ft. by 98 ft.

Usually three or four types of services will cover the requirements for all ordinary small residences. The service will be the same regardless of the type of wiring used for the branch circuit work, therefore this division of the job will be considered first. These conditions will be assumed as typical:

Service conductors to be No. 8, installed in conduit.

System grounding conductor connected to the neutral service wire to be No. 8, installed in conduit, and run to water pipe at nearest point. This conduit to serve as the equipment grounding conductor, that is, this conduit to be used as a conductor to ground the service conduit, service switch box, cutout box and branch circuit conduit or armor of cable. A bonding jumper to be installed around the water meter.

For 2, 3 or 4 circuits the branch cutouts to be combined with a meter service switch to form a single device.

For 5 or 6 circuits a separate box or cabinet to be used to contain the branch cutouts or panelboard.

House two stories high, service switch in basement. Separate cutout box, if used, to be mounted close to the service switch.

(Continued on page 52)

TABLE 25—HOUSE SERVICES

Item	Unit Cost	2-Wire 2-Circuit		2-Wire 3-Circuit		3-Wire 4-Circuit		3-Wire 5 or 6-Circuit	
		Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
½ in. Conduit	$6.00	12 ft.	$0.72	12 ft.	$0.72	12 ft.	$0.72	12 ft.	$0.72
¾ in. Conduit	8.00	20 ft.	1.60	20 ft.	1.60				
1 in. Conduit	12.00					20 ft.	2.40	25 ft.	3.00
¾ in. Service Head	0.62	1	0.62	1	0.62				
1 in. Service Head	0.95					1	0.95	1	0.95
¾ in. L Fitting	0.53	1	0.53	1	0.53				
1 in. L Fitting	0.84					1	0.84	1	0.84
No. 8 Wire	22.00	68 ft.	1.50	68 ft.	1.50	95 ft.	2.09	110 ft.	2.42
Meter Board	0.75	1	0.75	1	0.75	1	0.75	1	0.75
Service Switch		1	2.25	1	2.75	1	3.20		2.25
Cutouts & Box								1	2.75
Plug Fuses	0.03	3	0.09	4	0.12	6	0.18	8	0.24
Grounding Fitting for ½ in. Conduit	0.47	1	0.47	1	0.47	1	0.47	1	0.47
Meter Jumper	1.10	1	1.10	1	1.10	1	1.10	1	1.10
½ in. Grounding Bushing	0.10	1	0.10	1	0.10	1	0.10	1	0.10
¾ in. Grounding Bushing	0.11	1	0.11	1	0.11				
1 in. Grounding Bushing	0.15					1	0.15	1	0.15
Misc.			0.25		0.25		0.25		0.25
Hours Labor	1.10	4.5	4.95	4.5	4.95	5.5	6.05	6	6.60
Total			$15.04		$15.57		$19.25		$22.59

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Electrical Contracting
With Which Is Incorporated The Electragist
S. B. WILLIAMS
Editor

Carrying On

Last month we closed the doors in the old home and now we are living in the new. The old home, The Electragist, was awfully comfortable and we enjoyed it. This new home, ELECTRICAL CONTRACTING, however, is larger and more modern.

We used to talk to 9,000 readers each month—now we talk to 15,000. It means that Electrical Contracting goes to almost everybody worth while in the electrical contracting industry. With this larger and more complete circulation our responsibilities are larger and this we enjoy.

Moreover, ELECTRICAL CONTRACTING aims to be modern in every respect. Not only will it try to be up to the minute in every advance made in and by the contracting industry but it will present its information in the latest and most approved style—pictorially.

As before, we want to be on the closest and most friendly terms with all of our readers. Your comments on anything in this magazine or on any phase of the electrical business will receive our instant and best attention. If you have any problems perhaps, if you will let us know, we can help you find the right answer.

ELECTRICAL CONTRACTING is now carrying on.

* * *

Betwixt and Between

There is a class of electrical contractors who yesterday were prosperous, today are doubtful and who feel that tomorrow they may be gone—the neither large nor small fellows. The work they handle is not so large but what the small fellow can make inroads, nor so small as to be unattractive to the big fellow when times are a bit slack.

The men in this group started out small and had built their business to a point where it was comfortably profitable. They knew competition but it was a kind to spur them on.

Today, however, the competition instead of invigorating them seems to leave them in a stupor. They know not which way to turn. Some in their effort to escape the devastation have become hysterical and tried schemes on which no sane business man would venture. Some have resignedly closed their doors and sought employment elsewhere.

What is the answer? Is the class doomed? Or is this merely the periodic economic purging that comes to every business?

During the past few years the country has been engaged in a new building program far in excess of anything previously. Some of this group have grown not so much because of their own efforts as because of circumstances.

Now the new market for many of them has vanished and their own business is dwindling. They can save themselves, but will they? They can cut overhead and get out and hustle as in the old days—but will they?

They will or they'll sink!

* * *

Concentric Wiring

Before the war certain powerful central station interests attempted to bring concentric wiring into the United States. The effort failed but it left us with the manufacturing group strongly organized. Now, after a lapse of years we find the utilities have never given up their desire to have American houses wired with the cheapest of Europe's cheap wiring.

Concentric wire has a central conductor covered with insulation and an outer steel jacket which is the other side of the circuit. Properly installed and carefully maintained it is a safe system. Certainly it has cheapness in installation costs in its favor.

On the other hand, it will require much more rigid inspection than any system now on the market because of the danger that will arise if any one of a dozen things happen. All connections must be absolutely tight. Any loose connections will give slow leaks that will cause trouble. Trucks and other heavy traffic in streets today have a way of shaking things loose in buildings. Concentric wiring could never stand up under the strain.

Concentric wiring will need periodic reinspection at frequent intervals. It would not be long, therefore, before any saving in initial installation cost would be more than offset in reinspection cost.

Furthermore, the country is pretty well wired today as to the number of houses. Concentric wiring doesn't go with other types of wiring. It is different in every way. Are we to scrap present wiring or attempt to hitch this other type to it? And if we do what a wonderful opportunity for reversals.

No, it just won't do. Europe, contrary to what our misguided central station friends may say, is not sold on concentric wiring. Are we to take up what even Europe won't stand?

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The central stations are quick to holler when anyone suggests any change in their methods. They have cried "confiscation" when worn out and obsolete investment has been ordered off their books. Nevertheless, they have never hesitated to urge cheap wiring and cheap European practices, though it may mean the scrapping of millions of dollars of investment in other branches of the industry.

Fortunately, this insistent and ill advised demand for cheaper wiring comes only from a few. We wonder why the rest of the power industry doesn't silence the disturbing few so that the entire electrical industry may devote all of its energy to attacking the common problem of market development rather than dissipating so much time and energy in warding off attacks from within.

* * *

No Place to Cut Down

The building industries are engaged in a home modernizing movement—they take an old home in good condition and by rearrangement and change make it modern both as to appearance and equipment.

When electrical contractors are asked to figure on such jobs they should remember that the owner wants a modern home in every particular.

A bungalow was recently modernized in Minneapolis at a cost of $2,300. The new fixtures cost $60.00, the wiring $35.00. Could a thoroughly modern job of wiring be done for that price?

If the owner was willing to spend $2,300 to make his house modern, he wasn't going to balk at $50.00 more to make his wiring up to date. When an owner wants the latest it isn't fair to give him anything else.

Therefore, we urge all of our readers to remember that a rewiring job to modernize a home must be according to *today's* idea of adequacy and convenience.

* * *

Quantity Survey Bureaus

The decision of the Electrical Board of Trade of New York to discontinue its Electrical Quantity Survey Bureau is at once a disappointment to some and a signal for the "Why?" from many who are interested. Local groups of Electragists who have operated or are contemplating the establishment of similar bureaus should seek to know the underlying causes for this apparent failure of the principle in the metropolis, and should refuse to be discouraged by what is probably at worst another temporary lapse of progressiveness in the average contractor's conception of practical cooperation and good business. The principle of central estimating and quantity surveying remains an economic challenge. Can duplication of effort be minimized? Can a high degree of accuracy be maintained? Can a reliable centralized service be established on a basis commanding the patronage of a large proportion of the contractors? Can elimination of waste and consequent economy to the consumer be effected through this agency? If the answer is "yes," a method is somewhere to be found for applying the principle in practice.

On those who say "no" rests the burden of proof.

Armored Cable Improvement

Two announcements this month from the armored cable industry are of great interest to electrical contractors. The first is the appointment of A. Penn Denton as engineer director of the Armored Conductor and Flexible Metallic Conduit Section of the National Electrical Manufacturers Association. The second is the announcement by a prominent manufacturing company of a new armored cable designed to eliminate the installation troubles of present cable.

Mr. Denton is an engineer, a contractor, a Code authority, a man whose integrity and judgment are known and respected throughout the country. For many years he has been championing the cause of better wiring. Therefore his appointment as engineer director of the armored cable and flexible metallic conduit group is like a statement of policy.

Armored cable has lost many friends and there was a reason for it. Distrust of the manufacturers one for the other, competition on a basis of price, lowering of quality, short coils, the entrance into the business of a few manufacturers with no regard for standards or business ethics, have all had their share in weaning people away from a product which should have a secure position in the market.

Furthermore, when criticisms came from inspection authorities and electrical contractors, the manufacturers, instead of trying to find a way to correct these faults, charged their critics with bias or bad faith. The manufacturers neglected to take note of the fact that competition in house wiring demands speedy workmanship. This speed resulted sometimes in cut insulation, poor connection at the box, shorts caused by the sharp edges of the armor biting into the conductors. Such troubles did not have to occur very many times before the inspectors and the contractors, who had to do the work over, became critical.

Now, however, things are changed. The manufacturers, instead of apparently being intent on destroying each other and the product as well, are now going after the market on the basis of an improved product. While such a product has been announced by one manufacturer, the logical step would be for the other manufacturers to secure a license to produce the new type of armored cable and thereby help stabilize the market.

There is another side to the picture, also. We now have three inexpensive types of house wiring: Knob and tube, sheathed cable and armored cable. Our misguided friends in the central station industry have been urging the introduction of still another type, on the grounds of low cost. In so doing their attack has most frequently been against armored cable. This new move of the armored cable group, therefore, takes one weapon out of the hands of the people who would bring cheap European wiring methods into this country.

We have enough wiring methods. Additional methods would not mean more wiring but it would mean loss of investment by manufacturers and added stocks by jobbers and contractors.

This move of the armored cable group, therefore, should appeal to the manufacturers of competing lines as well as to the contractors.

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A.E.I. News and Service Information

A.E.I. Local Charter Plans

Since the adoption at the Electragist Convention in Chicago last August of amendments to the A.E.I. Constitution and By-Laws providing for local group membership affiliation by charter, many applications have been made to the international association for such charters.

The Membership Committee of the A.E.I. has prepared forms of charter agreement, certificate of charter and jurisdictional provisions, which are now before the International Executive Committee for approval. These will be ready for release shortly.

In the meantime, local associations should communicate with the A.E.I. headquarters office, and obtain the information necessary to submit applications for charters preliminary to official action by the Charter Committee.

This new organization plan of the A.E.I. has been widely accepted as a constructive step, affording to local associations a stronger Electragist identification, and bringing to the International a more direct representation of field needs and membership group problems.

* * *

Electragists Standard Accounting System

Commencing on November 1, orders for Electragist Standard Accounting Systems will be filled from a new stock of improved forms recently adopted. While accounting principles previously followed are consistently maintained, several changes in detail and size of forms have been effected in this edition, making possible a 15 to 20 per cent reduction in price and simplifying its operation substantially.

The "Cash Paid" sheet and the "Voucher Disbursement" sheet have been condensed into a single "Cash Paid and Voucher Disbursement" sheet of the same size. The ledger sheets for "Accounts Receivable" and "Accounts Payable" have been increased in size from 7 in. by 8 in. to 8½ in. by 11 in., with corresponding increase in the size of post binder for same. The bound general ledger has been superseded by loose leaf ledger sheets 8½ in. by 11 in. to be placed in the ledger post binder mentioned, which will be equipped with three complete A to Z indexes. Form No. 17, "Analysis of Overhead Expense", Form No. 18, "Profit and Loss Statement", and Form No. 19, "Cumulative Statement of Overhead Ratios" have been punched to fit the 9 in. by 14 in. loose leaf binder. The 8½ in. by 14 in. compression binder formerly used for these sheets has been discontinued, although the punchings will not prevent the continued use of binders.

A number of the important changes in the improved system are the outgrowth of recommendations received from T. V. Hunter, accountant for members of the California Electragists.

Inquiries about the improved system should be addressed now to the Association of Electragists, International, 15 West 37th Street, New York City, to assure proper installation before January 1, 1929.

Coggeshall Appointed on Procedure Committee

Allan Coggeshall, president of Hatzell & Buehler, Inc., New York City, has been appointed by the Association of Electragists, Int'l, as their representative on the Sub Committee on Procedure of the Electrical Committee, N.F.P.A., taking the place of A. Penn Denton, who has resigned.

1928 National Electrical Code

Copies of the 1928 National Electrical Code have been sent by the A.E.I. to all of its Electragist members. Requests for additional copies should be sent direct to the National Board of Fire Underwriters, 109 Leonard Street, New York City, with remittance of ten cents per copy.

* * *

Mechanics' Lien Act

The Association of Electragists, International, has filed with the Standard State Mechanics' Lien Act Committee of the Department of Commerce, objections to the proposed changes in the Second Tentative Draft of the "Uniform State Mechanics Lien Law," as embodied in a "Supplement" minority report.

The proposed changes would provide for the retention by the owner until final settlement of 10 per cent of all progress payments to the general contractor as sole protection against default in payments by the general contractor to sub-contractors, materialmen and laborers. The A.E.I. opposes this plan for the following reasons:

"The purpose of a Mechanics' Lien Act is to set up such safeguards as will assure the application of moneys paid by the owner to his general contractor first to the settlement of all obligations made by that contractor with sub-contractors, materialmen and laborers.

"The attempt of the supplement to the Uniform Mechanics' Lien Act to relieve the owner from responsibility for obtaining sworn statements from the general contractor before making progress payments to the contractor by substituting therefor the retention of only 10 per cent of each payment billed by the general contractor, defeats the purpose of such an Act.

"The requirement in the original Second Tentative Draft that the owner shall obtain from the contractor sworn statements of all amounts due subcontractors, materialmen and laborers, with waivers of lien therefor previous to each progress payment, gives more adequate protection and does not place, we believe, undue burden upon either the contractor or the owner."

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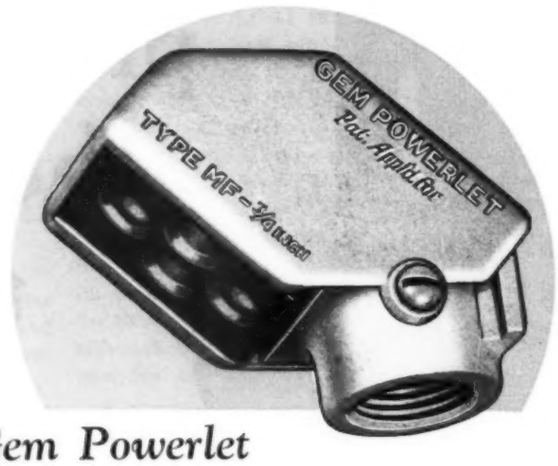

Showing the fitting in the horizontal position note the single screw permitting quick change from one mounting to the other.

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Reversible *Gem Powerlet* Service *Entrance Fitting* with only one locking screw

The M F Gem Powerlet Entrance Fitting is reversible to permit either vertical or horizontal mounting. In either mounting, it is weatherproof. The base, cap and cover are locked in position with one brass screw, which cannot be removed and lost. The cap is so designed that maximum wiring space is allowed; no sharp bends in the wires are necessary and wires are pulled through in a straight line. The galvanized finish assures long attentionless service. Covers are of composition—having two holes and two knockouts which provide for 2, 3, or 4 wires. Listed as standard by Underwriters' Laboratories. Made in sizes from ½ to 1¼ in.

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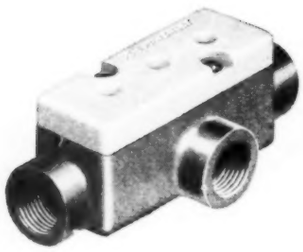
Most Widely Known Line of Fuses

Old in number of years, high in quality, dependable in performance—these facts explain why Union Fuses are accepted everywhere.

Unions are made in knife blade and ferrule types—the knife blade type for the larger capacities, one of which is illustrated. In the knife blade type the ends of links are notched so that nuts which hold them need be loosened only slightly to remove or replace.

In the ferrule type the links are furnished bent at one end to make renewal easy and quick.

Union Casings withstand more blowouts. Because they are worth more—they really cost less.



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Cast in one piece, Gem Powerlets have no seams, welds or inserts, and because of the toughness of malleable iron they will not crack.

Hubs are threaded accurately, guaranteeing waterproof joints and elimination of high resistance points in the conduit run.

Powerlets are easily, quickly installed because they provide plenty of room for wiring, lie flat, and the assembling screws of the cover do not drop out and get lost.

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Gaseous Tube Signs are growing more popular every day and each sign requires one or more transformers. Insure the satisfaction of every customer by installing Jefferson Transformers.

They are extremely small, due to efficient design—cool in operation—and will light the tube to the same brilliancy from the maximum to the minimum length of tubing, assuring attractive displays always.

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You should have the latest Union-Gem-Jefferson Catalog No. 33 which lists conduit fittings, fuses and transformers for every requirement. A copy will be mailed on request.

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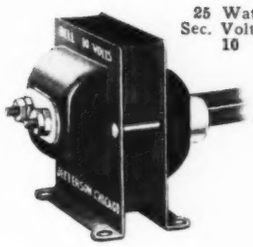
25 Watts
Sec. Voltage
10



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Perfect balance in construction assures maximum output with low temperature rise. Even on steady heavy duty the rise in temperature is hardly detectable.

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Contracting News

A "Blue Shirt" Convention

California Electragists departed from their regular practice and confined their fall convention this year to contractor-dealer attendance only. Because the entire program was devoted to problems of the electrical contractor and dealer, with no provision for the entertainment of ladies or representatives from the other branches of the industry, it is being called the "Blue Shirt" Convention. It was scheduled to be held at Fresno on October 27.

During the day parallel sessions were held, one for contractor-dealers and one for motor specialists with a joint session in the evening to discuss the new International setup, changes in the new International constitution, the new dues, etc.

The special session for contractor-dealers on Saturday morning was devoted to a discussion of merchandising distribution, the Detroit Credit Plan, cash discounts and kindred subjects touching on the relations of contractor-dealer and jobber. The afternoon session covered central station merchandising, market development, local association activities, including quantity survey, cost accounting activity, code matters, etc.

A special session for motor dealers followed along somewhat the same lines as those of the National Motor Section.

* * *

St. Louis Working Out Credit Plan

A credit plan patterned after the Detroit Plan has been in effect in St. Louis since July 1. The tenth of the following month is set up as the maximum discount date. Sixty days after the end of the month in which goods were purchased, the purchaser goes on the C. O. D. list unless payment for goods has previously been made.

Ten jobbers and two manufacturers are at present cooperating and these constitute all of the major sources of supplies for local contractors.

The plan is being promoted by the St. Louis Chapter of the Association of Electragists which started with thirty-three members and now has forty-two.

So far the plan appears to be working very smoothly and no real obstacles have been met. There is something less than three hundred licensed contractors in St. Louis at the present time.

* * *

Denton to Direct Armored Cable Field Work

A. Penn Denton of Kansas City, who for the past 12 years has been a member of the Executive Committee of the Association of Electragists International, has disposed of his contracting business in Kansas City, Mo., to become engineer director of the Armored Conductor and Flexible Metallic Conduit Section of the National Electrical Manufacturers Association.

Mr. Denton is very well know for his work in connection with the development of the National Electrical Code. Since 1920 he has been chairman of Article 5 Committee which is

A. Penn Denton

probably the most important committee dealing with Code revision, handling as it does the entire subject of Wiring Methods. During the past two years Mr. Denton has given considerable time also to the work of the Wiring Standards Committee of the A. E. I.

The formation of local code committees in a large number of cities was the result of Mr. Denton's activities and in recognition of this work he received in 1925 a certificate of honorable mention under the first McGraw Ward.

Upon graduating from Cornell in Electrical Engineering in 1904, Mr. Denton went to Schenectady where he entered the General Electric Test. Later he was engaged in engineering and commercial work in that company's foreign department. Twenty years ago he moved to Kansas City where he started his own business, the Denton Engineering and Construction Company, which specialized in industrial and commercial electrical installations. In addition to his work on the National Executive Committee Mr. Denton has been president of the Electric Club of Kansas City, president for three years of the local electrical contractors association, and a director of the Missouri State Association of Electrical Contractors and Dealers.

Mr. Denton is also a member of the A. S. M. E. and a fellow of the A. I. E. E.

* * *

City Inspectors Meet At New Orleans

The thirty-third annual convention of the International Association of Municipal Electricians was held at the Monteleone Hotel, New Orleans, La., October 23-26, with representatives present from virtually every part of the United States. The business program was exceptionally complete. In addition to the reports of the several committees the convention had numerous papers on fire alarm, police alarm, and air port lighting, electrolysis control, traffic control, and street lighting.

The first general session was the broadest in scope and dealt with electrical inspection and the 1928 National Electrical Code. The speakers and their papers were as follows:

1. Uniform Electrical Ordinances. H. B. Kirkland, Society of Electrical Development, New York, N. Y.

2. Grounding with Safety Circuits. W. M. Runyon, engineer groundulet division, Crouse-Hinds Company, New York, N. Y.

3. Service of Underwriters Labora-

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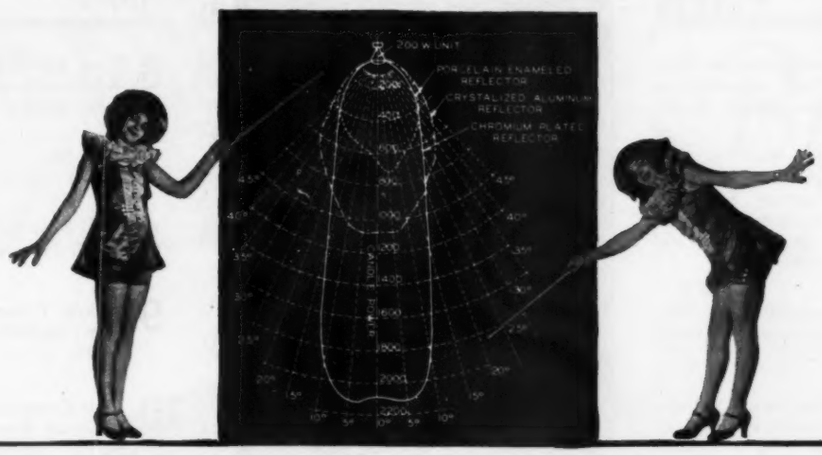

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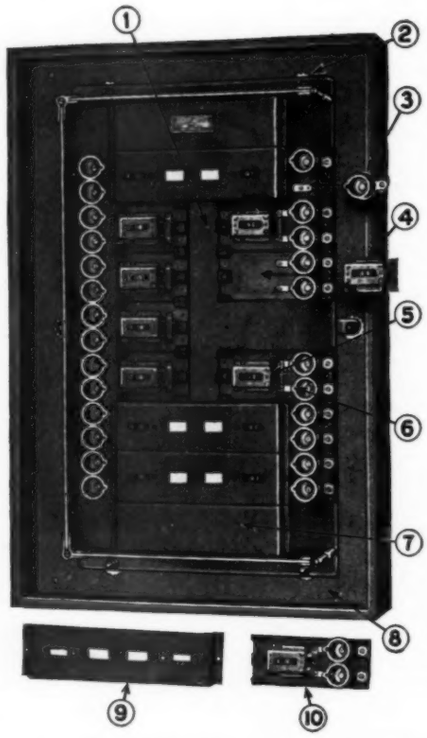

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6 Fuse Receptacles have slot at side which permits testing of fuses without removing fuse.

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When you recommend, specify or install reflectors or other units bearing the label "Certified by Benjamin" in accordance with the specifications and standards worked out in the "Guide to Productive Lighting" you take the job out of price competition. You can assure your customer the fullest benefits from his lighting system, plus protection of his investment over a lifetime of service.

This label and this book are the key to Lower Production Costs, Less Spoilage, Fewer Accidents, Decreased Labor Turnover and Maximum Use of Floor Space.

BUY BY THE LABEL AND GO BY THE BOOK

This Book is FREE TO YOU

It gives specifications for effective lighting systems; correct intensities of light for industrial interiors; reflector spacings and lamp sizes; the reflector or unit to use for various conditions or plant operations; and a simple method of gauging the effectiveness of an industrial lighting system.

Benjamin Electric Mfg. Co.

120-128 So. Sangamon Street

New York **Chicago, Ill.** **San Francisco**

© 1928

tories. C. J. Peacock, service engineer, National Board of Fire Underwriters, New York, N. Y.

4. The Municipal Electrical Inspector's Relation to National Electrical Code. Wm. S. Boyd, secretary western section, I. A. E. I., Chicago.

5. A Local or National Standard—Which? George Welman, chief electrical inspector, Louisiana Rating and Fire Prevention Bureau, New Orleans, La.

6. Why Wiring Jobs are not Approved. W. M. Sullivan, city electrical inspector, Charlotte, N. C.

7. Talk on 1928 National Code. C. S. Graham, city electrical inspector, Jacksonville, Fla.

* * *

Pennsylvania Association Still Hopes for Legislation

Proposed state legislation for licensed electrical contractors again received attention at the 1928 convention of the Pennsylvania State Association of Electrical Contractors and Dealers held at Pittsburgh, October 8, 9 and 10. The license law which the Association has prepared was presented to the State Legislature but too late to be acted upon at the last session. It was reported that the present bill was a composite of about twenty-seven bills previously drawn up. Those that are fathering the bill have considerable hope that it will go through at the next session of the Legislature.

The association had employed legal counsel to investigate and report on the legality of merchandising associations by central stations. The counsel reported that the courts would probably rule that merchandising on the part of utilities could be construed as a necessary adjunct to their business. They also reported that since power companies were not engaged in interstate commerce no assistance could be expected from the Federal Trade Commission.

In addition to the talk on legislation by W. V. Pangborn, president of the association, the convention listened to L. W. Davis, general manager of the Association of Electragists, discuss organization.

N. J. Biddle, author of the Detroit Credit Plan, and manager of the Detroit Association of Electragists, told the convention about the results obtained in Detroit through a definite credit policy. His remarks were enthusiastically received and provoked considerable discussion.

Andrew H. Blass of Andrew H. Blass & Company, official auditors of the Electrical Contractors Association of Pittsburgh, gave an interesting talk on accounting for electrical contractors, bringing out the value of comparative analysis of statements, both financial and operating, among association members.

A central estimating bureau was the subject of an address by Arthur P. Peterson, manager of the Maryland Division of Electragists.

The convention closed with a banquet and dance on Wednesday evening with nearly 150 in attendance and in addition to well-known speakers, R. J. Wensley, inventor of the Televox Man, gave a demonstration of the performance of this almost human mechanism.

The Convention in Action—As Seen by Reichold of the Pittsburgh Press.

* * *

Toledo Electragists Organize

After several months' preliminary work, a number of Toledo, Ohio, electragists have formed a new electrical contractors' organization to be known as The Electragists' Bureau of Toledo. Final details were worked out at a meeting in the Chamber of Commerce on October 2.

The primary purpose of the organization is to enable the contractors to participate in the electrical industry sales promotion movement which is about to be launched on a nation-wide basis. The idea of this movement is to compete for consumer-attention with other industries, such as plumbing equipment, roofing materials, paint, insulating materials, fences, farm implements and a number of others, which are spending millions in publicity and advertising and which are accomplishing their purpose, to the detriment of other products that are not similarly promoted by their industries.

The three other branches, the manufacturers, the wholesalers and the power companies, have placed their organizations solidly behind this new movement, and in many cities the contractors have fallen into line. By setting up their new bureau, contractors of Toledo have enlisted for full participation in this enterprise.

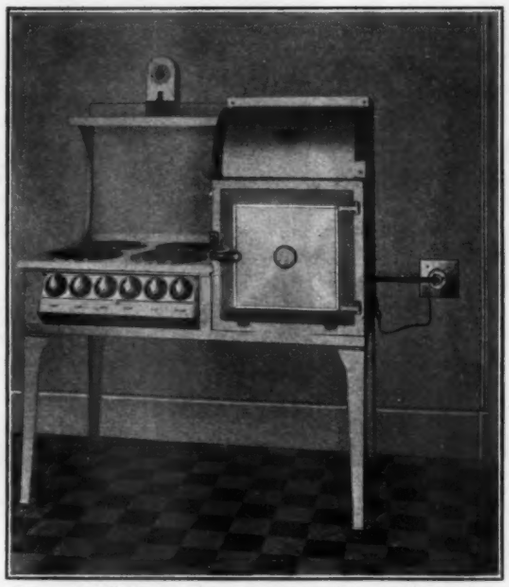
Attention is called to the fact that the function of the new organization is promotional and not supervisory. Matters pertaining to cost-finding, estimating or similar practical phases of the electrical contracting business, are outside its scope. Beyond agreeing to observe the Code of Ethics of the Association of Electragists International, members shall have no business obligations toward one another.

Any electrical contractor or contractor dealer having been in business for more than one year in the territory served by the Toledo Edison Co., is eligible for membership in the new bureau. Each applicant will be required to show good moral standing, a thorough technical knowledge and prove that he understands the principles governing the conduct of a successful business. Each applicant shall be required to be a member of the Electragists Association International.

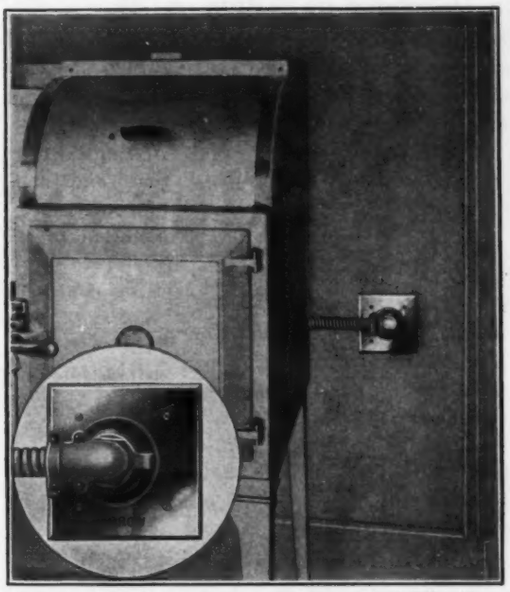
UMI

Make The Electric Range Portable With ARROW Plug-In Devices

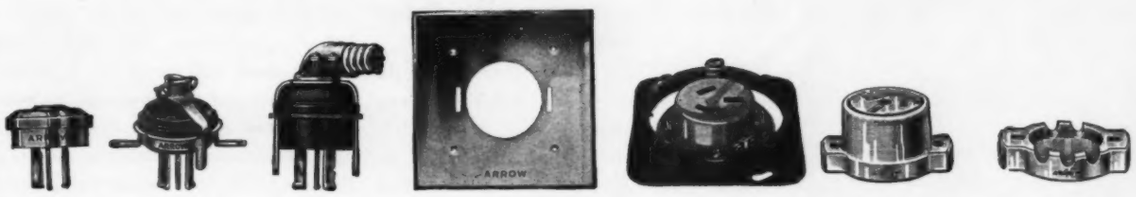
For Heavy Duty Appliances



Range installation, with separate ground connection, using No. 8286 Porcelain Cap.



Range installation, providing ground thru cap and BX cable, using No. 8295 composition Angle Cap.



No. 8286 No. 8292 No. 8295 No. 8298 No. 8285 No. 2899 No. 8294

Cat. No.	60 Amperes 125 Volts, 40 Amperes 250 Volts	Cat. No.	60 Amperes 125 Volts, 40 Amperes 250 Volts
8286	Porcelain cap with ½-inch cord hole (30 amperes)	8285	Flush receptacle with plaster box cover
8287	Porcelain cap with ¾-inch cord hole (30 amperes)	8288	Solid brass plate for No. 8285
8297	Porcelain cord grip cap, ¾-inch hole (30 amperes)	8298	Solid brass plate for 8285 with contacts for ground
8292	Composition cord grip cap, ¾-inch hole (30 amperes)	8293	.060 steel plate for 8285 with contacts for ground
8291	Heavy duty cap for BX cable (40 amperes)	8299	Porcelain surface receptacle
8295	Heavy duty angle cap for BX cable (40 amperes)	8294	Porcelain sub base for surface receptacle

No. 8205 is designed for standard 4 11/16" x 4 11/16" box.

ARROW HEAVY DUTY PLUGS AND RECEPTACLES

1. Reduce the present obstacle to sales of electric ranges and other heavy duty appliances by cutting down the installation cost.
2. Put heavy duty appliances on a proper merchandising basis.
3. Eliminate permanent connection and service problems.

Every new home and apartment should be equipped with an Arrow Heavy Duty Receptacle, even as it is now piped for gas.

THE ARROW ELECTRIC COMPANY
HARTFORD, CONNECTICUT

ARROW

The complete line of Wiring Devices

The executive committee of the new organization is composed of Arnold E. DeFrance, Clarence F. Hammer, Marvin W. Hansen, Fred E. LaFrance, H. C. Scannell and Paul H. Thatcher. L. M. Krepleever was appointed acting manager, and will conduct the affairs of the bureau for the present.

* * *

Edison Decorated by Nation

Thomas A. Edison has just received the tribute of the nation in the form of a gold medal voted to him by Congress. Secretary of Treasury Mellon presented the medal to Mr. Edison at the Edison Laboratory, West Orange, N. J.

* * *

Haig Heads Western Inspectors

The officers elected at the twenty-fourth annual meeting of the Western Section, International Association of Electrical Inspectors, held at Denver, Colo., September 10-12 were as follows:

President, William A. Haig, chief electrical inspector, Department of Buildings, Milwaukee, Wis.

First Vice President, L. A. Barley,

William A. Haig

chief engineer, Mountain States Inspection Bureau, Denver, Colo.

Second Vice President, A. G. Hall, chief inspector, Hydro-Electric Power Commission, Toronto, Canada.

Secretary-Treasurer, William S. Boyd, electrical inspector, Western Insurance Union, Chicago.

Executive Committee, R. L. Daniel, Chairman, Minneapolis; C. W. Abbott, Rome, N. Y.; A. H. Friend, Chicago, Ill.; G. H. Parker, Louisville, Ky.; J. G. Galbraith, Detroit, Mich.; and H. R. Markel, Cincinnati, Ohio.

* * *

Cost Accounting in California

Word comes of continued progress of Electragist accounting activities in California. In Los Angeles a committee on cost accounting has been formed, consisting of R. M. Fry, C. T. Smallcomb, L. H. Ellett, and G. P. Gordon, to consider ways and means for giving the Electragist Standard Accounting System wider local publicity and for financing time-payments of contractors who desire the system installed in their businesses but are unable to pay in a lump sum.

Six contractors in Bakersfield, representing a large proportion of the business there, have placed their orders for complete Electragist systems. After many months' study of their local problems they concluded that accurate knowledge of their costs and efficient control of their businesses through correct accounting methods, bid fair to eliminate many of their troubles and to make them more intelligent competitors.

* * *

Market Development Work for Philadelphia

Marking the 11th anniversary of its founding, a luncheon conference was held in the rooms of the Electric Club of Philadelphia on September 13, at which announcement was made of a two-year business development program that places the club on the list of the country's active merchandising-and-market-development electric leagues.

Announcement was made by C. Lester Sherman, Jr., president of the club, that Pierre Brosseau, formerly assistant manager of the Electric Association, Chicago, had been appointed managing director of the reorganized club and already had plans underway for an active fall campaign. Assisting Mr. Brosseau will be George R. Conover, formerly president of the Electrical League of South Jersey.

Alfred L. Hallstrom, chairman of the Development Committee announced, on behalf of the club's board of governors, that the first step would be the staging of an Electric and Radio exhibition, to be on a scale comparable to that of annual automobile shows. The Coliseum, the city's largest auditorium, has been selected for the exhibition which will open November 17 and continue until November 24. In all there will be 361 booths and attendance is expected in excess of 200,000 persons during the seven-day showing.

The show will cover the entire

Pierre Brosseau

gamut of electrical display including spectacular lighting features, every possible educational phase of electrical phenomena and home use of electrical appliances. General chairman of the show will be E. E. Hedler.

The second phase of the promotional program will be a far-flung selling and educational campaign with respect to industrial and commercial lighting. To tie in with the mid-winter holiday activities, there will be a Christmas Lighting Campaign.

* * *

May Quote Glassware "Net Each"

A committee of the National Electrical Wholesalers Association and a committee representing the Illuminating Glassware Guild have been in conference discussing the recommendation made by the Wholesalers Association that manufacturers of glassware quote "net each" instead of "per dozen."

It is understood that the manufacturers' representatives have acknowledged the economic soundness of this recommendation and at the next meeting of the Guild will bring in a favorable report urging the adoption of the "net each" method of quoting prices.

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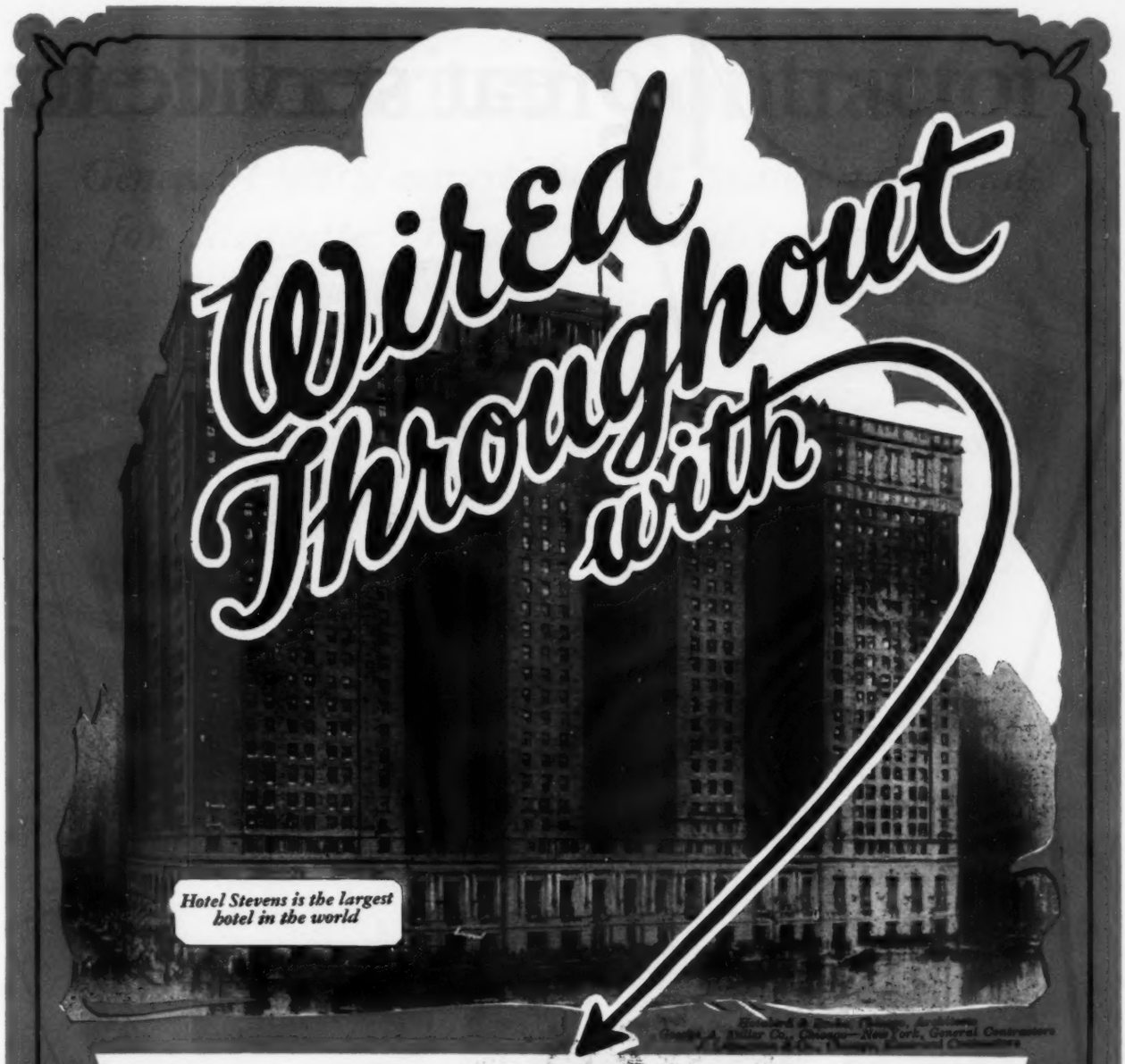


American Steel & Wire Company's RUBBER COVERED WIRE

Only the very finest material and the most rigid specifications were approved for this great building. The selection, therefore, of two million feet of our rubber covered wire to meet these demands expresses most forcefully the uniform and dependable quality of the product and further gives striking evidence as to the standing with leading architects and customers.

Let us send you our indexed catalog and handbook of electrical wires and cables. Estimates furnished promptly from any of our offices in all of the principal cities.

AMERICAN STEEL & WIRE COMPANY

SALES OFFICES: Chicago, New York, Boston, Atlanta, Birmingham, Cleveland, Cincinnati, Philadelphia, Pittsburgh, Buffalo, Detroit, Cincinnati, Baltimore, Wilkes-Barre, St. Louis, Kansas City, Minneapolis-St. Paul, Oklahoma City, Memphis, Dallas, Denver, Salt Lake City, *San Francisco, *Los Angeles, *Portland, *Seattle. *United States Steel Products Co.

A great service to

Quicker, better work when electric
has a real chance to do its pa
GENERAL ELE
In the children
adequate wiring is
GENERAL E
Plenty of outlets
bring electrical comfort into every room
Plan your wiring when you plan your home
GENE
WIRING SYSTEM
Have you enough outl
...can you make toast
GENERAL ELEC
Where will you want your lamps
....where will you plug in your cleaner?
Plan your wiring when you plan your home
WIRING SYSTEM
—for lifetime service
GENERAL ELECTRIC
Have outlets for a fan and an iron
—and don't do your work in shadow
Plan your wiring when you plan your home
WIRING SYSTEM
—for lifetime service
ELECTRIC

What greater assistance could be given a contractor than advertisements like these? They are building a demand for better and more adequate wiring.

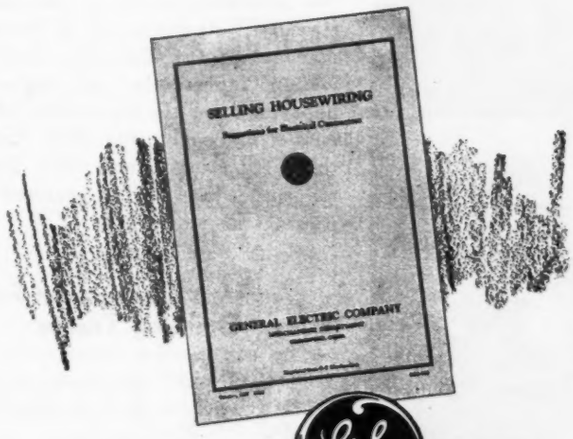
the Electrical Contractor

General Electric advertising has created a demand for adequate wiring and quality materials . . it has made housewiring truly profitable!

EVERY contractor knows the sort of competition that existed in the housewiring field a few years ago. Prices were cut to the point where no profit remained for the contractor who wanted to do a first class job. Too few outlets were installed—thus reducing opportunities for the sale of appliances. And too often inferior materials were used.

Today, consistent advertising of the General Electric Wiring System, has made every prospective buyer and builder recognize the *vital* part which wiring plays in the comfort and beauty of the home.

Contractors everywhere have used the General Electric advertisements as text-books that point the way to correct and completely planned wiring. They have taken the ads right with them to help sell the idea of adequate, high quality wiring to their prospects. Try this plan yourself—you will find it profitable.



"Selling Housewiring"

Here is a helpful little book which has such practical chapters as "Selling the Business Man a Real Housewiring Job", "Selling the Speculative Builder," "Selling the Man Who is Building a House." etc. You can get some direct facts that may prove important to you. Drop us a card today. Address Sec. EC-11, Merchandise Dept., General Electric Company, Bridgeport, Conn.

WIRING SYSTEM

—for lifetime service

GENERAL ELECTRIC

$250 for a Word!

The manufacturers of molded products want a new name—a coined word to become identified with all molded products as "rayon" is now used to mean artificial silk.

This NEMA Name Contest offers a prize of $250. It is sponsored by the Molded Insulation Section of the National Electrical Manufacturers Association.

The definition of the material to which the name will apply is: "Any substance composed wholly or in part of an artificial gum capable of setting into a hard, non-softening body." Radio panels and knobs, telephone receivers, heater plugs and pipe stems are well known examples of molded products.

Names submitted should not be based on the ingredients now used as they may change as the industry develops. They may or may not be descriptive of the properties or uses of the material. The name may even be totally unassociated with the industry.

Each contestant may submit only one name and may submit on the same sheet—if desired—an argument of not more than fifty words in its favor. Each contestant's name must be on a separate card.

Suggestions must be mailed in a sealed envelope marked "NEMA Name Contest," addressed to the National Electrical Manufacturers Association, 420 Lexington Avenue, New York City, before midnight, January 15, 1929. Results of the competition will be made public before March 15, 1929.

* * *

Model Lighting Equipment Specifications

The Artistic Lighting Equipment Association is making plans to draft a set of model specifications for lighting equipment to be used by architects, builders, contractors and others. Architects especially, it is stated, are to a great extent still writing specifications which have been obsolete for a number of years past and have been laying down conditions and restrictions which have proved especially expensive to the electrical trade. The association states that it is not likely that such stipulations or conditions would have been required if a standard code of lighting equipment specifications had been in existence.

Specifications will be provided by a committee composed of George Cassidy of the Cassidy Company, Chairman; Melvin Spencer of the Frink Company; and L. D. Auchmoody of the Sterling Bronze Company, together with a representative of Curtis Lighting, Inc., who will be named later.

* * *

Hear Talk on Business Law

Simon Rasch, a New York attorney, talked to the Independent Association of Electrical Contractor-Dealers of New York on October 10 on "Business Law." Later in the evening Mr. Berger of Curtis Lighting showed moving pictures of the association's July outing.

The association is now completing its twenty-fifth anniversary and plans to celebrate the event in fitting fashion on January 17 next.

* * *

Estimating Class in Knoxville

Sixteen electrical contractors, electragist members of the Associated Electrical Contractors of Knoxville (Tenn.), have formed a study class in cost estimating, using as a guide the estimating course of the Association of Electragists. W. R. Sammons, manager of the Knoxville local association, reports that the engineering department of the University of Tennessee is cooperating with them in this estimating course and has extended the use of its classroom facilities to the electragists.

* * *

Accident Prevention For Building Trades

The construction industry of New York City under the auspices of the Accident Prevention Committee of the Building Trades Employers' Association has begun to take recognition of the mounting number of accidents to construction labor. On September 27 more than 250 people representing every trade in the construction industry gathered for the first round table discussion on the subject.

While nothing of concrete value to the electrical construction industry de-

Now Wiring New Pittsburgh Skyscraper: The 32-story Koppers Building, Pittsburgh's latest large structure is being wired by the Craig Electric Co. The building has high speed elevators, inter-locking switchboards for light and power and has underfloor duct. J. V. Burke, head of the Craig Electric is upper right and beside him is Joseph Colbourne, the superintendent. Below is one of the crews on the job which is in charge of Foreman Joyce, the second from the right.

ANNOUNCING

The New EVEREADY PORTABLE FLASHER

Dry Battery Operated

Automatic—Economical—High Visibility—Rugged Construction—to warn of Highway Hazards—also for Marine Use

NATIONAL CARBON COMPANY, Inc., announces the new Eveready Portable Flasher, which has been designed primarily for use wherever lanterns are now needed, but which also has many other fields in connection with land and water traffic.

The new Eveready Portable Flasher operates entirely on Eveready Columbia Dry Batteries, and provides an intermittent or flashing signal of much greater visibility than an oil lantern.

While the first cost of the flasher is higher than that of an oil lantern, in the end it is much more economical. A check up of the cost of operation for oil lanterns, including labor for maintenance, reveals that one oil lantern costs, on the average, $50 a year to maintain. The Eveready Portable Flasher costs approximately $10 a year to maintain, on the basis of renewing the Eveready Columbia Dry Batteries once every two months. This long and economical service is due to the light and intermittent load on the batteries, a load under which their capacity is best utilized. Eveready Columbia Dry Batteries are universally obtainable for renewals, and in this new device will again prove their economy and reliability.

SPECIFICATIONS—Height 16 inches. Diameter of base 7 inches. Weight, including batteries, 16½ pounds. Requires four standard Eveready Columbia 6-inch dry cells connected in series to deliver 6 volts. Extra 6-volt lamp inside battery housing. Battery compartment constructed of seamless steel attractively finished in red. Top of flasher cadmium plated for weather protection. Heavy fresnel type red glass lens. Padlock for battery compartment with an extra long hasp so that the device can be chained. This flasher is of rugged construction throughout and entirely weather-proof.

The new Eveready Portable Flasher is sold through National Carbon Company's distributors.

NATIONAL CARBON CO., Inc.
New York, N. Y.
Branches
ATLANTA CHICAGO KANSAS CITY
LONG ISLAND CITY SAN FRANCISCO

Unit of Union Carbide and Carbon Corporation

EVEREADY
TRADE MARK
PORTABLE FLASHER
—dry battery operated

a new field for Eveready Columbia Dry Batteries

REPRODUCED herewith the opening announcement of a brand-new product—the Eveready Portable Flasher. This uses Eveready Columbia Ignitors, and early reports indicate a wide sale for the new device. This opens to dealers a new field for Eveready Columbia Dry Batteries.

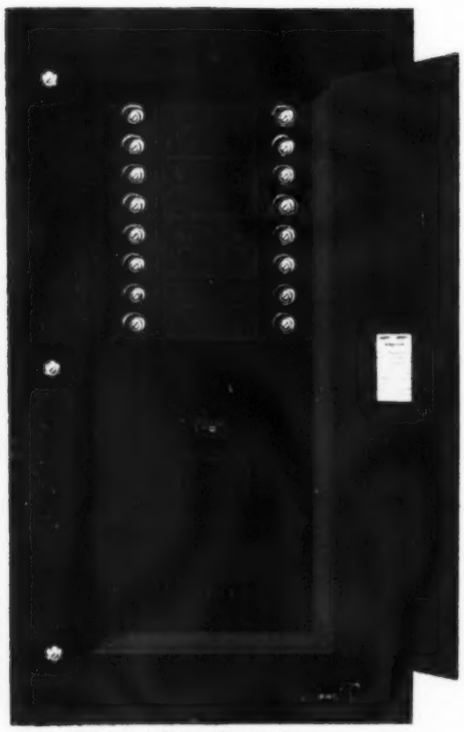
NATIONAL CARBON COMPANY, INC., New York, N. Y.
***Branches*—Atlanta, Chicago, Kansas City, Long Island City, San Francisco**
Unit of Union Carbide and Carbon Corporation

EVEREADY COLUMBIA Dry Batteries
—they sell faster

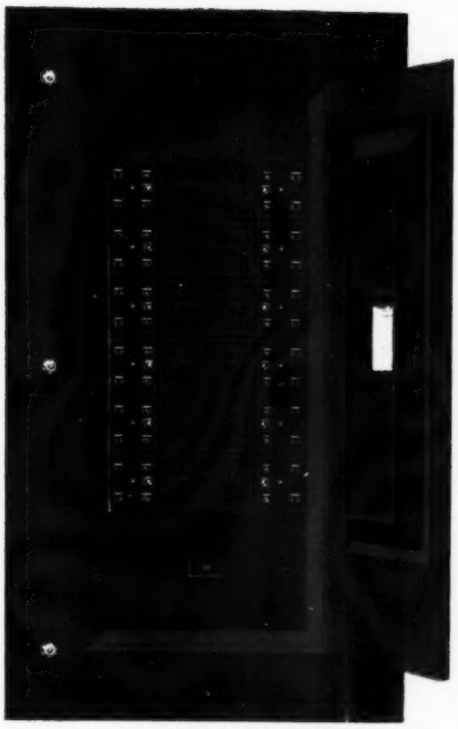
UMI

The New SQUARE D

LIGHTER . . .



With Main Switch
Single Door
(All molded parts genuine BAKELITE)



With Main Fuses
Door-in-Door
(All molded parts genuine BAKELITE)

With Lugs in Mains
Single Door
(All molded parts genuine BAKELITE)

BRANCH OFFICES

Boston
New York
Philadelphia
Baltimore
Richmond
Atlanta
Birmingham
Syracuse
Buffalo
Pittsburgh
Grand Rapids
Cleveland

BRANCH OFFICES

Cincinnati
Chicago
Milwaukee
Minneapolis
Indianapolis
St. Louis
Kansas City
Dallas
Denver
Los Angeles
San Francisco
Portland

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UMI

Panelboard....

SMALLER ...

MANY NEW AND EXCLUSIVE FEATURES

Designed and Built to **SQUARE D** Standards

Square D has spared neither time nor engineering expense to make this new line of panelboards worthy of the Square D name—in appearance, serviceability, durability, safety, value.

They are less bulky than previous types of panelboard—and lighter by far. Yet innumerable construction features show what extraordinary attention has been paid to strength and capacity for *heavy duty*.

Among the outstanding features, exclusive with Square D, is the use of genuine Bakelite, in walnut color, for all molded parts, 21 in number. Circuits, too, are designed with Bakelite numbering buttons.

Main switches of 60, 100 and 200 ampere capacity are of the Square D improved brush type with exceptionally quick break—a new and exclusive design.

Handles and panel trim adjusting screws are all chromium plated — another exclusive feature —as is the use of olive green dull finish on the standard trim. All metal parts are rust proofed.

Another unusual feature, of great advantage in industrial use, is that plug fuses and cartridge fuses are interchangeable — you need only remove the plug fuse section and replace it with one designed to hold cartridge fuses. This may be accomplished without removing the panel from the cabinet.

These are but a few of the "high points" of design and construction that make Square D panelboards outstanding products in their field. The number of box sizes needed have been reduced—yet the line is *complete*—meeting every requirement of industrial service.

Jobber representatives and Square D district managers will gladly submit quotations and give any desired information.

SQUARE D COMPANY, DETROIT, U.S.A. (136)

FACTORIES AT: DETROIT, MICH., PERU, IND.

SQUARE D

ELECTRICAL EQUIPMENT

UMI

$200.00 in CASH PRIZES
FOR WINDOW DISPLAYS OF MERCHANDISE ILLUMINATED WITH
1st PRIZE $100
2nd PRIZE $60
3d PRIZE $40
Sterling STIPPLE Reflectors
Contest Opens November 1st
Closes December 15th
Awards of Prizes will be made one week later, Saturday, December 22. All photographs entered in the contest must be in the mail not later than midnight, December 15.
The Following will Act as Judges in the Awarding of Prizes:
J. W. COLLINS, Sec'y Elec. Cont. Ass'n, Chicago, Ill.
GEO. J. COWAN, Pres., Koester School Window Display, Chicago, Ill.
E. H. LEAKER, Display Manager, Henry C. Lytton & Sons, Chicago, Ill.
Contest is Open to Electrical Jobbers, Electrical Dealers and Electrical Contractors
SIMPLY send for an Enrollment Blank which entitles you to enter the contest. You are at liberty to submit as many different photographs of window displays as you wish, but only one (1) cash prize will be awarded to any one contestant who wins. In case of a tie the full amount of the prize will be awarded to both contestants. Electrical merchandise of any make or manufacture is to be used for the display, and the window must be illuminated with Sterling Reflectors, which will be furnished on request.
Windows Will be Judged According to Merit on the Following Basis:
1st. Effectiveness of Illumination. 2nd. Attractiveness of Display. 3rd. Sales Appeal which the display creates.
Sign and Mail Coupon for Enrollment
REFLECTOR & ILLUMINATING CO., 1415 Jackson Blvd., Chicago, Ill.
Please send us Enrollment Blank.
☐ Check here if you desire Reflectors furnished.
Name .....
City ..... State .....
PHOTOGRAPHS OF WINDOWS SHOULD BE MADE AT NIGHT TO PROPERLY REVEAL THE EFFECTIVENESS OF ILLUMINATION.
Reflector & Illuminating Co.
Manufacturers and Engineers
1415 Jackson Blvd.
CHICAGO, U. S. A.
Representatives in All Principal Cities

veloped, it is apparent that remedial measures planned for the construction industry will secure effective results among wiremen.

* * *

Lighting Equipment School Proposed

It has just been announced that the Artistic Lighting Equipment Association, with the cooperation of the lamp manufacturers, is studying a proposal to conduct a lighting and lighting equipment school. The course would probably be covered in a short period of three to five days. No plans have as yet been worked out, but it is understood that no fee will be asked of those in attendance and that the course will be open to all members of the industry.

* * *

Milwaukee Organizes for Home Modernizing

The Electrical League of Milwaukee is tying in with the other building industries in promoting a modernizing activity pointed at the reconditioning of old homes. In a recent bulletin of the league it states:

"We have long realized that this was the big electrical market and a united effort of all building industries in a continuous advertising and promotional Campaign is bound to bring results in Milwaukee as it has in a number of other cities. Further details will be sent later, but in the meantime consider very definitely the immense market which can be developed, and prepare to get in on the returns."

* * *

New York Board of Trade Suspends Weekly Letter

The Weekly Service Letter of the New York Electrical Board of Trade has temporarily been discontinued. This letter which has been published ever since the Board started some five years or more ago is known all over the country and has been widely quoted. Charles L. Eidlitz, chairman of the board, has written every issue of the "Service Letter" and has used it to spotlight many evils within the industry and outside where affecting the industry.

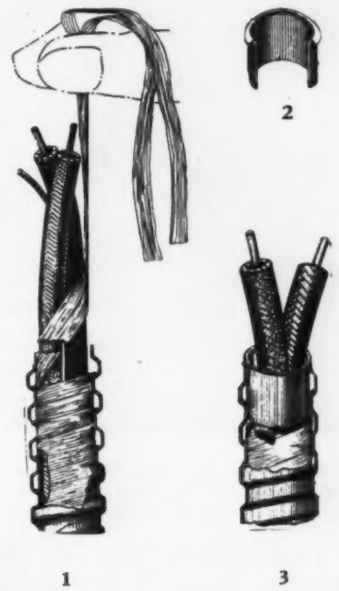
Whether or not the service letter will be resumed was scheduled for discussion at a meeting of the board of governors around the end of October.

Electragist Emblem in Stained Glass:—H. W. Reichle of the Call-Us Electric Co., Inc., 1717 Carson St., South Side, Pittsburgh, Pa., sent us a photograph of their store front, showing their use of the Electragist Emblem. So far as we know this is the first time anyone has displayed the emblem in stained glass.

New Idea in Armored Cable

Numerous criticisms have come from the field about armored cable chiefly because of faults arising from installation. To remedy these faults a new armored cable has been announced by the National Electric Products Corporation. The new features are as follows:

First, specially wound fibrous insulating material about the rubber covered conductor which can be unwound with a pulling motion. In this manner the trouble from cut rubber installation caused by running a knife along the woven sheath is eliminated.



1—Two Conductor Cable Showing Spiral Insulation Being Pulled Off.
2—Split Tubular Bushing.
3—Bushing in Place Between Conductors and Armor.
Note that spiral wrapping has been unwound below end of armor giving bushing plenty of room.

Second, a split bushing of insulating material which slips between the cable and the armor. This prevents the sharp edges of the armor from cutting into the insulation about the conductors and thereby causing shorts and grounds.

Third, no metal sleeve will be required at the end of the new cable, thus eliminating one great source of installation annoyance.

Fourth, the specially wound insulation is so made as to have a cushion effect and thereby prevent slippage.

UMI

Fowler Owns Motor Made in 1889

T. C. Fowler, president of Reserve Electric Co., Cleveland, O., has many interesting memories of things electrical in the "good old days," but none is quite so striking as his 39 year old motor, with which he is shown in one of the accompanying photographs.

One of the oldest in Northern Ohio, this motor is of 1/16 H. P. and weighs 20 lbs.—just three times what the same machine would weigh today. This "Grand-daddy of Motors" began

T. C. Fowler Holding Motor that Has Been Used to Drill Teeth for More than Quarter of a Century.

its life-work in the office of a Cleveland dentist in the old Rose Building, and turned his drills for more than 25 years. Although somewhat worn and battered, its working parts are still intact and it operates very much as it did in 1889.

Mr. Fowler's interest in motors, which led him to acquire this relic for his "museum," is even stronger today, and his company specializes in power applications and repairs along with its general electrical contracting. The firm maintains a repair shop equipped for any emergency and pays special attention to electrical repairs for printers, who are constantly in need of this service.

* * *

Standard Packages of Cord

The Flexible Cord Section of N. E. M. A. has appointed a committee to study the standard package situation and endeavor to work out standard units.

* * *

Red Seal Contest Nets Fifty Jobs.

The Cash Prize Contest on Red Seal Applications, which ran in Milwaukee from July 18 to August 18, resulted in fifty homes being wired under the Red Seal Plan. Fifteen contractors filed applications, and of these nine had not formerly sold any Red Seal jobs.

It is estimated that 1760 outlets were installed above the average which means that Red Seal pays.

Weinman Electric Company, with a total of twenty-one installations, won the first prize of $20.00. Gogan, Martz, and Sternlieb were tied for second place, and the $15.00 for second and third prizes will be divided after final inspection of the roughing-in of these jobs have been made.

The Men Who Make Reserve Electric Stand for Service:—Left to right, T. C. Fowler, president; C. E. Lewis, salesman; C. Whipple, secretary and Frank Jambor, who handles the inside repairs in the shop.

Cheap Wiring Propaganda Dangerous*

By W. S. BOYD

Secretary Western Section, International Association of Electrical Inspectors

Undermining the National Electrical Code is regarded in some circles as encouraging invention and promoting progress. Progress is usually upward and not downward.

The demand of the world is for better things but it is sometimes tricked into accepting inferior articles because they seem cheaper and look just as good as the higher priced articles, but practical experience with this so-

W. S. Boyd

called economy has not always proved it to be a wise policy.

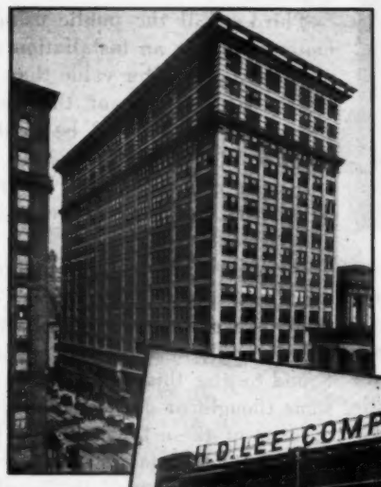
The undermining proponents forget that inventive genius can always be exerted to improve the product and such efforts have usually been rewarded.

The automobile industry has developed prosperity solely by constant improvement in the safety, reliability and durability of the motor car. Consolidation and simplification have made mass production possible with its attendant economies resulting in price reduction.

The motor car demand is for better cars and better service, but in the electrical industry, there is a hue and cry in certain circles for that which is cheap in wiring methods and mate-

*Abstracted from an address presented before the International Association of Municipal Electricians, New Orleans, La., Oct. 24.

HAZARD



Pierce Bldg., St. Louis, Mo.
A. B. Groves, Inc., Architects

Chicago Beach Hotel, Chicago, Ill.
George B. Nimmons, Architect

H. D. Lee & Co. Bldg., Kansas City, Mo.
J. C. Sunderland, Architect

Glen Alden Coal Co., Scranton, Pa.
Kenneth M. Murchison, Architect

Some Hazard Installations

We Could Fill the Pages of this Magazine

with photographs of the buildings in which Hazard Rubber Insulated Wire has been used. And that means wire of "Quality." For Architects and Electrical Engineers know how important it is that the wiring should be of the highest quality for that insures uninterrupted service.

And better quality wire means greater profit to you.

HAZARD INSULATED WIRE WORKS

Division of the Okonite Company

WORKS: WILKES-BARRE, PA.

SALES OFFICES:

New York	Chicago	Philadelphia	Pittsburgh	St. Louis	Boston
Atlanta	Birmingham	Seattle	San Francisco	Los Angeles	Dallas

rials. Apparently these agitators forget that service demands are increasing by leaps and bounds. Let us have better wiring installations until satisfactory conditions of service and safety are reasonably approximated or exceeded, then there will come the only legitimate incentive to reduce the standard for wiring but until that time, however, let us have as our motto: "Better wiring for better service."

Mass Production

Economies incident to mass production can only be realized through effective standardization and simplification. Standards for electrical materials and fitting that are in a constant state of flux and are menaced by the threat of constant amendment definitely hobble efficient mass production. The greater the variety of materials and fittings, the smaller is the amount of mass production that can be indulged in.

Every type of wiring added to the list increases the expense of the manufacturer, jobber and contractor and this increase, which is in the form of overhead expense, must be paid for by the ultimate consumer. Let the electrical inspector ponder this statement when he is tempted to vote additional wiring systems into the Code. The plan to reduce the cost of wiring by increasing the number of wiring systems would, therefore, seem to be based upon falacious thinking.

Simplification

The true path to economy lies in the direction of simplification, as every clear thinking engineer knows and the electrical inspector who has the best interests of his clients (the public) at heart will work for simplification as against duplication when considering proposed amendments in the National Electrical Code. If you wish manufacturers to bring to you the benefits of mass production involving giant factories, vast quantities of expensive automatic machinery and immense stocks of the finished product in warehouses ready for instant shipment, you must be prepared to protect that investment from the vicious attacks of those who would ruthlessly destroy their value under the subterfuge that the public demands something cheaper, which usually means a less sturdy and, therefore, a less reliable article.

Someone will ask: "Are we to stand by the systems we have and never make any change, no matter what the future may bring forth?"

The answer is—"No"; but such changes as are made should be predicated upon fair dealing with those who have served you faithfully in the past. Losses to these, your friends, brought about by Code revision should in all justice be absorbed in some way that will distribute the burden over a period of years and prevent what is to all intents and purposes confiscation.

When the electrical service company is faced with the problem of being forced to render service at less than cost plus a reasonable profit, they can hike into the Federal Court and get relief, but these same people are sometimes blind to the rights of others having large investments in buildings, machinery and stocks, the value of which is threatened with extinction by the tearing down process as applied to electrical wiring standards.

There are other features that deserve consideration before the existing electrical standards are permitted to be further undermined by the advocates of alleged economy and a few of these are given below:

First—Some recognition must be given to the large property loss attributed to fires of electrical origin before present standards are impaired.

Second—Correct ascertainment should be made as to the susceptibility of the proposed material to damage and abuse by the building trades and the public in general, both during and after the installation period. Experience with wiring systems already in operation will help decide this question.

Third—Will the public using such material obtain an installation that is of relatively greater value than would be the case if one of the then approved systems should be used? In other words, is the proposition one of low price coupled with a lower value or will the public get more real value for its money?

Fourth—How will the material be used in the "tall grass towns," where there is no inspection service to protect the public? Are you not in duty bound to give this phase of the matter some thought or do you think that the citizens of these towns should be left to shift for themselves in this respect? Try and put yourself in the place of a citizen of one of these small communities desiring electric service. Would you want the small town electrical contractor to put such a system into your home or place of business without the protection afforded by rigid inspection?

Fifth—How would you like to be a manufacturer of electrical material or fittings and after years devoted to a sincere effort to develop large scale production of quality goods, find the market for your output suddenly paralyzed by an inferior substitute for your products which is given equal recognition by the inspection authorities? The Golden Rule is a safe guide under such circumstances.

Wiring Large School Addition:—These brothers, Fred, (right) and Emil Rebele, head the Axthelm Electric Co., Pittsburgh, Pa. At the time this was taken Fred was paying close attention to wiring a big school addition in Wilkinsburg. One of the features is an auditorium that, for size and lighting, compares favorably with a regular theatre.

* * *

Oppitz League Director

Frank Oppitz, president of the Milwaukee Chapter of Electragists, has been elected a director of the Electrical League of Milwaukee to succeed George Andrae, resigned.

* * *

Domestic Electric Service 90 Per Cent Standardized

Householders may now move from any part of United States to almost any other part of the country with the certainty that their household electrical devices can be used equally well in the new home. This is due to the standardization of voltages which has been going on for some years. According to the National Electric Light Association, 90 per cent of all the current used in residences in the United States is now of one voltage.

Shall we let a sharpened pencil smash them?

You are a successful contractor. Around you other contractors are "going to the wall."

Does it matter much to you?

Perhaps you've thought it does. Perhaps you've thought it doesn't. Perhaps you haven't thought about it much at all.

In any event, here is a viewpoint that should interest you.

NOT every human being is, or can be, successful.

This is as true of the human beings in the electrical contracting business as it is of those in the hardware or farming or shipbuilding business. We may expect an occasional contractor to close his doors as we expect other merchants to.

But, in the case of many a contractor who goes to smash, isn't there a threat of a common danger to those who remain? Isn't there . . . and this is no vague question but a summing up of opinion in the industry . . . an ever present doubt as to who will next suffer from the relentless competition of the sharpened pencil?

It's all in the viewpoint

"My competitor has gone out of business. Fine! I bet our low bids helped to squeeze him out," says one contractor, in his not-too-far-sighted wisdom.

"Poor So-and-So couldn't make the grade against this crazy price-cutting," says another contractor, more thoughtfully. "Too bad; he was a good workman. I wonder whom the axe will fall on next."

Thus, it may all be a matter of viewpoint.

But strangely enough, the man with the broad viewpoint may be thinking of himself first. For when he is thinking of himself, he must still be thinking of all electrical contractors as entitled to a fair and secure share of profit from the American public.

Now here comes the big question of the day: Will the American public permit the electrical contracting industry to ask a fair share of profit without recourse to price-cutting which would destroy that profit?

Here is a question which some men in the business answer, No; while others answer, Yes. Yet, impartially, it is hard to see how any industry can be deprived of its rightful profit as long as it is doing an essential job — *unless the public doesn't understand the industry.*

The public appreciates —then pays

The public understands, for example, the walnut growing industry when that industry talks quality and ignores price. Similarly, it understands the orange growers. These industries, to cite two out of many, have changed what might have become terrific price wars into profitable enterprises, based on quality merchandise.

Can the electrical contractor do the same?

This Company believes so; and has taken every possible opportunity of stating its belief in the contractor to the American public.

Moreover, this Company has supported the cause of quality with that high standard of electrical material that takes the edge off any attack by the sharpened pencil.

No. 4 of a series dealing with the every-day problems of the electragist.

GraybaR

Successor to *Western Electric* Supply Dept.

The Graybar Tag— symbol of distribution

UMI

Against Circuit Wire for Grounding

At the October meeting of the Eastern Section, International Association of Electrical Inspectors, held at Springfield, Thomas Henry Day, electrical inspector for the New England Fire Insurance Exchange, told of the dangers involved in using the circuit wire for grounding.

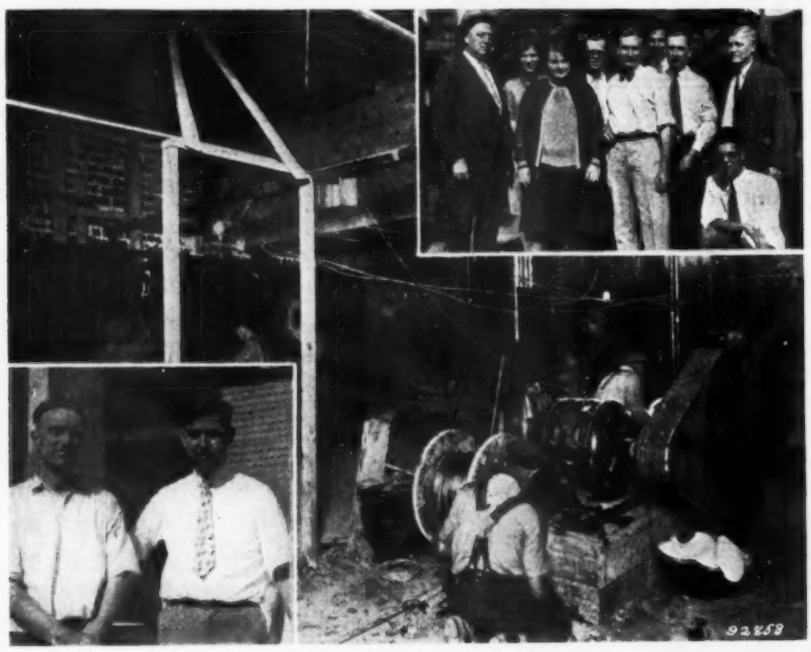
He had previously been asked whether or not this practice was dangerous and his reply was given in the following paragraphs.

"I desire that my answer be accepted," said Mr. Day, "as only reflecting my opinion, an opinion based upon almost fifty-two years in the science. I would not care to assume the responsibility of advocating the use of the circuit wire, even though that circuit wire was intentionally grounded, for the grounding of a motor frame or other types of appliance, as the possibilities for danger are great, the human element being involved; and that is an element, gentlemen, no ordinance, statute law or national code can completely control or even regulate. At least that is my opinion based upon an experience of over a half century.

"There is one possibility of danger, that I greatly fear has not received complete study, the danger from super-potential transmission and distribution systems. With the commendable evolution so noticeable in the electrical field of endeavor, a series of connections are now being used, through which the equipments and appliances in many communities are, at times, connected to primary transmission systems of 120,000 volts and to voltages of even a higher order. Just endeavor to approximate the possibilities for danger should several things occur at the same time and we were using a grounded circuit wire for the grounding of motor frames and other appliances, even including mi-lady's smoothing iron.

"In my field work, I have been called upon to investigate fires and accidents, the result of reconstructing pole lines, when, at the close of the day, the linemen, unintentionally, I will be willing to say, made transpositions of grounded secondary systems, resulting in fires within the buildings served by that system. This has also been my experience with extensions to interior systems, the transpositions resulting in fires and accidents, and absolutely and completely destroying the purpose and intent of an installation which had been, in its original condition, well within our required identified system of wiring.

"At one time, it was the practice to connect the service conduit and the interior metal system to the grounding conductor of the secondary system, and difficulties of a most serious nature arose when the grounding clamp broke down and the secondary net work was receiving the impress of the primary, a condition which nearly put me out. You will readily recognize, gentlemen, just what resulted; the conduit system had a difference in potential of 2300 volts to ground, a most dangerous thing for any one to touch when standing upon or in contact with a pathway to earth. That, briefly, explains why two grounding conductors are now required."



Finishing up Big Detroit Job: The floors and walls of the new Detroit Water Board Building, at Randolph and Bates Streets, will be a net work of low tension systems. Besides public telephone and telegraph circuits the building will contain dictograph, police call, watchmen and fire alarm and electric clock systems. The electrical work is being installed by the Miller-York, Inc. Two crews are shown giving the final touches to the Bull-Dog dead front totally inclosed light and power switchboard and the motor installation for running the air compressor system. Upper right is the staff of Miller-York (left to right H. P. Miller, Frieda Hartung, Edna Enko, Irvine Reed, Arthur J. Allyn, W. W. Kurtz, Walter D. Lingle, F. A. Byington and, kneeling, Roy C. Martin). Lower left—H. S. Churchill who is in charge of the electrical work in the building and W. W. Kurtz, outside man.

* * *

Seller Must Follow Shipping Instructions

A contractor is not bound to accept delivery of fixtures or other goods if the shipper fails to follow the specific shipping instructions of the buyer. This was definitely decided during the past few weeks by the higher Court in Freeman Electric Co. vs. MacMillian, 264 Pac. 491. Here it was shown that a contractor ordered a quantity of electrical fixtures. The order contained, among other things, the following shipping instructions: "Ship us via c/o Williams S. S. Co.," "Ship as elec. fixtures and mark bill of lading 'Part of Carload,' " and "Boats sail from Philadelphia from Drexel Bldg."—giving the dates.

The seller failed to follow the shipping instructions and the contractor refused to accept the shipment. When the shipper inquired why the contractor refused to accept the order the latter wrote a long letter in part saying: "I use the Williams Steamship Company as they are a little more elastic than any other boat company.

Just a twist of the wrist —that's all

Easy to handle, easy to install, built to withstand the hardest kind of service and sold at a price that is attractive . . . these are the features that have made the Condit Type N-4 the most popular switch for small motors, 5 H.P. or less.

It comes manually operated or with push button control, and with or without thermal cutouts for overload time-lag protection.

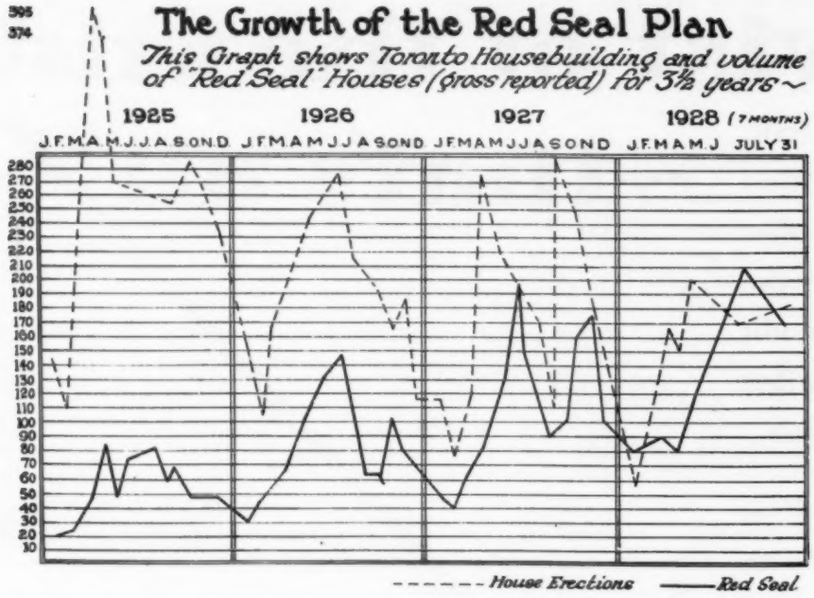
CONDIT ELECTRICAL MFG. CORPORATION
Manufacturers of Electrical Protective Devices
BOSTON, MASS.
Northern Electric Company
LIMITED
Distributors for the Dominion of Canada

Type N-4

1920

Specifications: *3 or 4 pole; standard sizes 30 amperes, 600 volts. For small motors, 5 H.P. or less. Approved by Underwriters.*

CONDIT


The Growth of the Red Seal Plan
This Graph shows Toronto Housebuilding and volume of "Red Seal" Houses (gross reported) for 3½ years
1925
1926
1927
1928 (7 MONTHS)
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J JULY 31
House Erections
Red Seal

Eighty-nine per cent of Toronto Home Building Permits First Half 1928 Red Seal:—The first city to promote the Red Seal Plan of adequate wiring has succeeded in making almost all new homes Red Seal. At present 320 builders are cooperating with the Electric Service League of Toronto to make all their houses Red Seal.

They own all of their ships, therefore are not controlled by the United States Shipping Board. It is with much difficulty that the writer is able to assemble a minimum car in the 45 days alloted by the boat companies, and the people like yourself, when you disobey shipping orders, make me pay the carload rate on the minimum car without securing the entire weight; also, you make me appear to the steamship company like I was trying to put something over, as they allow me the carload rate on the shipments on the first boat instead of holding it out on the final boat, and rebating me at that time."

The shipper thereupon sued the contractor for damages but the court held the latter not bound to accept the goods, saying:

"Appellant (shipper) does not explain why the goods were not shipped by the Williams Steamship Company, nor why the bill of lading was not marked, "Part of Carload"..... The failure or nonperformance of time or place of shipment as set out in a merchantile contract justifies the party aggrieved in repudiating the whole contract.....Upon failure of plaintiff (shipper) to obey shipping instructions, he cannot recover damages from defendant (consignee.")

Leo T. Parker

The Dog and the Bone

There is a lack of understanding amongst electrical contractors of the limitations that should be placed upon volume of business undertaken. One contractor, a very capable technical man, had on hand considerable business, which necessitated the use of every bit of his limited working capital and the borrowing up to the limit from banks and trade creditors. He had an opportunity to bid on further work—rush jobs as usual. The question that should have presented itself to him was whether or not it would be most advisable under the circumstances to complete the work in hand and make a satisfactory profit thereon or quote on and get the additional work for the carrying on of which no working capital was available. Like the proverbial tale of the hound with the piece of meat crossing the bridge who saw his shadow in the river and thought he would get another piece of meat, this contractor dove headlong in, quoted on the new work, and, unfortunately for him, got it.

Result, the sacrificing of a goodly portion of the billed price on the first jobs in a vain attempt to obtain the moneys ahead of time to provide the necessary working capital, and second, finding this means of financing the new business impossible, the paying of tremendous bonuses for special advances from financing organizations other than banks.

* * *

Estimating for Service Entrances

(Continued from page 23)

The calculations of the costs of the various types of services are most conveniently made in the form of a table such as Table 25. The quantities of material and hours of labor given in this table are reasonably accurate for the conditions assumed, but it must be particularly noted that the chief value of this and all other house wiring data presented here is to illustrate the method. Actual costs are likely to vary from the figures given here, on account of variations in local rules and requirements, in material costs, in the scale of wages, and in the productive efficiency of the workmen.

Under the new Code, the service conduit must be bonded to the conduit or wire serving as the grounding conductor for the service conduit. Grounding bushings are included for this use in the list of material in the table. Ground clamps may be used, but unless specially approved for use without protection they must be protected from mechanical injury. For connecting the system grounding wire and its conduit to the water pipe, a special fitting is listed which is approved for use without protection. The bonding jumper around the meter will of course not be required if the grounding connections are made on the street side of the water meter.

It is very easy to pick out the service material from the cost record of an actual job. The contractor should select a number of typical jobs, the more the better, and from his records determine the average quantity of material required for each type of service. The labor on this part of the work can be closely approximated by an experienced man, though a better plan is to keep actual records on several jobs separating the time spent on the service from the other work.

From this data the cost of each type of service should be worked out, using Table 25 as a model. The total cost of each type is the figure which will be used in estimating and these totals will be tabulated in convenient form for use along with the outlet costs.

UMI

UMI

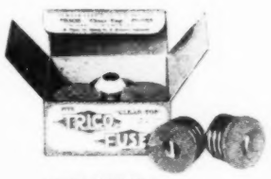
They're Out!

TRICO

REG. U.S. PAT. OFF.

0-6 AMP. 10 AMP. 15 AMP. 20 AMP. 25 AMP. 30 AMP.

"COLORTOP" FUSES



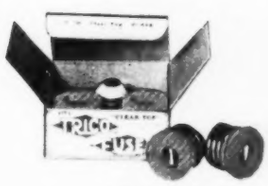
0-6 AMP.

The Capacity of a Plug Fuse is Now Known by the Color it Bears

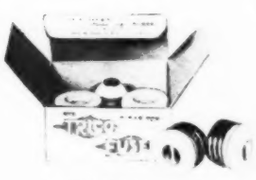
Simplifies Inspection, Makes Easy Selection and is Instructive to Users

A colored band around the edge of the 5 unit cartons indicate the capacity of the fuse the box contains. A help to storekeepers, stock-clerks and others to select and know the sizes on the shelf and bins quickly

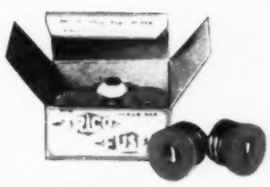
KEEP THIS SHEET FOR YOUR GUIDE



30 AMP.

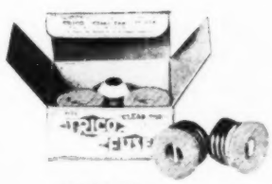


10 AMP.

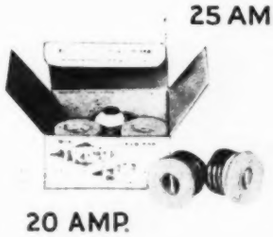


25 AMP.

They're packed in 5 unit cartons to facilitate merchandising - have the clear mica window that shows when they blow - and possess the qualities of large center contact, full threaded heavy shell and all porcelain non-shock top. **No additional charge will be made for the colored top.**



15 AMP.



20 AMP.

A 5 unit box of assorted samples is available free for the asking. Pin this slip to your card or letter-head. See from the actual fuse what a splendid indicator the color top makes.

Trico Fuse Mfg. Co., Milwaukee, Wis.

WARNING! The Colored Top for fuse plugs is fully protected.

UMI

An Old Name *with a* New Face

[Actual Size]

A Standard Line

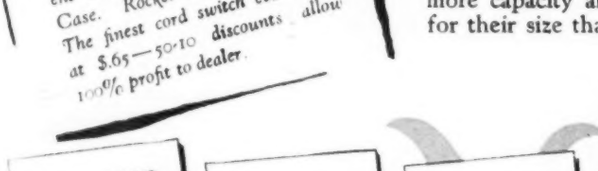
THERE'S nothing mysterious about wiring devices. There may be much that is misunderstood. Gaynor wiring goods have always typified the straightforward simplicity that means real quality. Substantially made, of the best materials, and with a recognized low price which results from the elimination of costly non-essentials that add nothing to value or performance. They are neither cheap junk made to sell at a price, nor extravagant jewelry "dolled up" to justify unmerited reputation.

With Radical Improvements

No. 520

Combination Feed Thru and Pendent Switch. Handsome Bakelite Case. Rocker-Motion Operation. The finest cord switch ever made at $.65—50-10 discounts allow 100% profit to dealer.

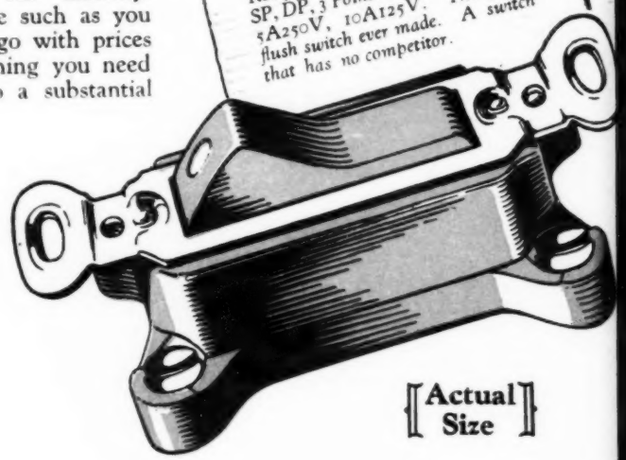
We are now adding new switches of the highest quality ever designed. Like all Gaynor products they are stripped of all non-essentials, but this new line is of "Rolls-Royce" construction. Especially noteworthy is the new Rocker-Motion Toggle Switch, exemplified by the No. 520 Cord Switch above, and the No. 510 Flush Switch below. These new switches have more capacity and long life for their size than any



switches ever marketed. They are now ready for **delivery.** Quality and service such as you have often dreamed of go with prices that are eye-openers. Everything you need to make a generous profit and do a substantial "repeat order" business.

No. 510

Shallow Flush Switch, Solid Bakelite Case, highest quality construction. Rocker-Motion Operation. Made SP, DP, 3 Point and 4 Point. Rated 5A250V, 10A125V. The finest flush switch ever made. A switch that has no competitor.



[Actual Size]

Quick Delivery

Jobbing stocks are being assembled as rapidly as possible. Factory stocks are ample. Shipment of these new lines can be made the day of the receipt of order at the factory.—

Order thru your jobber.

GAYNOR ELECTRIC COMPANY, INC., BRIDGEPORT, CONN

UMI

UMI

UMI

A New Type of Engineering Service

By E. H. HERZBERG
Manager, Milwaukee Chapter Association of Electragists

IT has been the custom of architects to rely upon the contractors for the making of their electrical layouts and the writing of their electrical specifications and to base their assurance that the job would be properly done on the efficiency and integrity of the various city, state and national inspection departments. This was manifestly wrong because it placed an unwarranted and unethical burden upon the contractors and inspectors, made the architect impotent and caused the investor and owner to be made the hapless victim of unsound though sincere procedure. Architects, contractors, inspection departments and public utilities have long recognized the inherent weaknesses of this arrangement and made many serious efforts to find some feasible and generally acceptable way out.

You electrical contractors all know on what basis you have been submitting your bids and understand the underlying, subtly hidden causes of the widely divergent figures quoted. You know, too, why you are entirely justified in your refusal to submit your layouts. You also know what the writing of specifications plus the engineering necessary for the writing of those specifications has cost you.

Costly Figuring

Nine contractors figure on a job. If all figure on the same basis, then each must separately engineer his layout, write his specification and submit his bid. Only one can be successful. Eight must be unsuccessful and each of these must write off the cost of engineering and specifications as a total loss. If nine contractors bid on nine separate jobs, one, perhaps even the most capable and expert of the nine, may be unsuccessful in all nine cases; in which event the cost of engineering to him becomes practically ruinous. On the other hand if nine contractors use, as the basis of their bids, the specifications written by any one of them, the eight using the specifications of the ninth are foredoomed to lose being at the disadvantage of the weighting of his specification by the ninth contractor in obedience to the most fundamental law of all life—the law of self-preservation.

To make a thoroughly engineered electrical layout and produce a first rate specification costs money. This money must be paid by someone other than the contractor if the contractor is to remain in business or if the quality of his work is to be good. Yet the contractors have been valiantly endeavoring to carry this burden while the architect has garnered his fee in total and the investor has been the sufferer. This is not right. It is not equitable. You contractors have been drawing on your sales and service profits in order to make good the chronic deficit in the competitive contract branch of your business. You have found that where you have justifiably weighted your bid with the cost of your engineering your bid has been too high and you have lost the contract. In sheer self defence, some of you have done haphazard, mediocre work and often paid severe penalties upon disclosure effected by rigid inspection. There is not one logical or justifiable reason why you should carry the cost of this engineering.

Why 2 Per Cent?

Mind now, the allotment of 2 per cent of the total cost of the building for electric wiring and fixtures has become fixed on the basis of data obtained as a result of this rotten arrangement under which you have been struggling to keep from doing your part of the work at a loss. No wonder it is only 2 per cent! No wonder the electrical installation—the very life of any building—is considered low caste alongside of plumbing with its 10 per cent, heating with its 8.7 per cent, hardware and metals with 7.6 per cent and painting with 6.5 per cent! Indeed, the marvelous thing is that you could at all even approximate the stringent requirements of existing laws in return for your small portion of this altogether too small a percentage. And the fact that your installations have all passed the most rigid inspection is a splendid, glowing tribute to your ingenuity and resourcefulness. But compliments are not capital and cannot produce profits. Making plans and writing specifications is not a part of your work. And to perform this work without receiving adequate, just compensation therefor is the height of rankest folly.

Where, then, does this work properly belong? It is part and parcel of the duty of the architect—the designer of every part of the building—the key man—the "buffer" between his client, the investor, and his employees, the builders. In delegating this part of his task to you contractors, the

Maximilian N. Bodenbach

architect only succeeds in advertising his own incompetence and dereliction, reducing himself to a state of impotency and making his client the hapless victim of your unequal struggle for existence.

Owner Pays

And so it is upon the wholly sound, common sense premise that the architect's client is willing to pay a reasonably adequate, commensurate price to prevent his ultra modern, utilitarian and beautiful architectural reality from being neutralized by an inadequate, over-economical, wasted, antediluvian electrical installation that a new type of engineering service has been originated and is being built in Milwaukee. Our local electrical organization, recognizing the need for such a service, has encouraged Maximilian N. Bodenbach to undertake it. Its very first objective is to guard and

promote the interests of the investor —a consideration that is paramount because it is indisputably fundamental. This having been assured, the cost of engineering and specifications can then be placed where it rightfully belongs, namely, back, via the architect, on the owner of the building. And in return for the money invested a first class, thoroughly engineered and constructed electrical job will be produced to exactly met the peculiar requirements of each individual case and which, through its efficiency, will write itself off the owner's books at the earliest possible date.

Unbiased

This new scheme, where followed, entrusts the electrical engineering equally with other branches involved to a thoroughly trained and experienced, highly specialized mind that is unbiased because untrammeled by commercial attachment or influencing liaison. It provides the owner with an electrical installation that enhances the imposing importance of his building, increases its rental and sales value, eliminates all electrical fire hazards and minimizes his maintenance by virtue of its adequacy and extreme flexibility.

Its Value

It keeps the architect potent by investing him with due power backed by clear, concise, detailed, authoritative plans and specifications to which he can compel adherence. It causes all questions relative to electrical plans and specifications to be referred by the architect to the originating engineer thus saving him much valuable time and relieving him of many troublesome worries. Through simplification, it considerably reduces the cost of the architect's construction supervision. It anticipates and forestalls the costly changes of after-thought. It minimizes the necessity for test and facilitates inspection. It relieves the architect of the onus of wasting his time with salesmen and their biased engineers and of making vital decisions relative to matters in a specific field so vast and intricate that, as in architecture, expert knowledge is acquired only after many years of intensive study coordinated with much practical experience. It puts the architect actually in charge of this branch of his work on a firm foundation of expert, defensible information as to what is really needed and good, thus insuring his client against loss through subtly hidden derelictions. It strengthens the architect's self-assurance, multiplies his good will assets and stimulates the growth of his business by augmenting his prestige.

By supplying all prospective bidders with identical plans and specifications this new scheme fairly places all of them on the same footing when making their estimates and submitting their bids.

It enables each individual contractor to take full advantage of the efficiency of his own organization.

It precludes the weighting of a specification to the advantage of any one favored contractor.

It relieves the contractor of the unjust responsibility and cost of engineering.

It eliminates the money loss resulting from lack of engineering knowledge or vision.

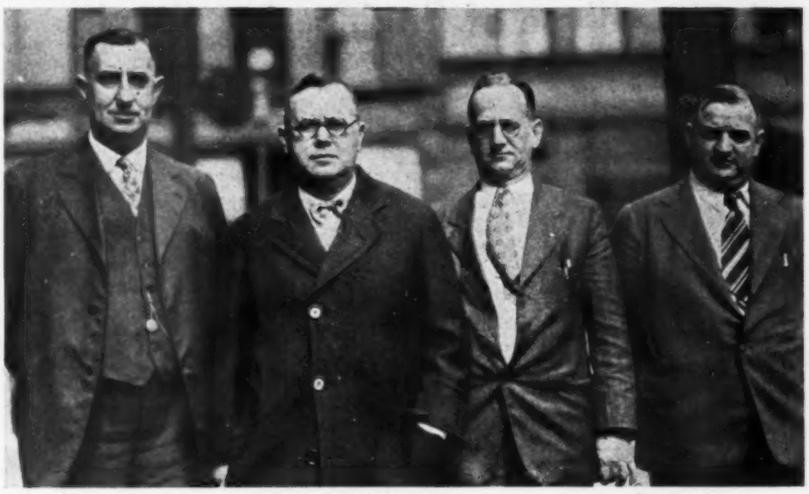
It minimizes construction labor and supervision.

It reduces the amount of material required per unit of power.

It gives the contractor his chance to display his adroitness, openly, and to build up a reputation founded on merit.

It banishes many obnoxious, to him uncontrollable, factors that hamper him in his efforts toward good management.

It enables him to grow and prosper exactly as he deserves.



Leaders in Promoting Team Work Among Cleveland Contractors:—These four men have all done fine work in the promotion of team work among the electrical contractors in Cleveland. Left to right: L. C. Kubach, secretary, Electrical Business Association; J. V. Becka, Electrical Contractors Association; G. C. Davis, president, E. B. A.; and C. Dill, Lakewood Electric Co. The E. B. A. held a big clambake on Wednesday, September 26, at Astorhurst Park Villa. Our friend Dill umpired the ball game and made it doubly interesting by letting 'em have six outs, five balls and four or five strikes, according to the needs of the moment. They point with pride to the attendance of 118, from all branches of the electrical trade.

* * *

Paid a Profits Tax but Took a Loss

A certain contractor in an eastern industrial city, whose practice it was to put in advance billings covering progress payments in excess of time and material actually spent, having considerable work in progress at the end of the year, closed his books on the basis of the advanced billings invoices rendered representing sales. He thought no harm was done, because it would all come out in the wash in the following year.

In this particular instance the operating results showed a healthy margin of profit. And we all remember that Uncle Sam is our partner when we have profits but not when we incur losses. The result was, several thousand dollars paid to Uncle Sam as taxes and hundreds of dollars paid to the State as taxes covering paper profits which unfortunately developed into very definite losses the following year.

In other words, this contractor ate

How About Safety Switches?

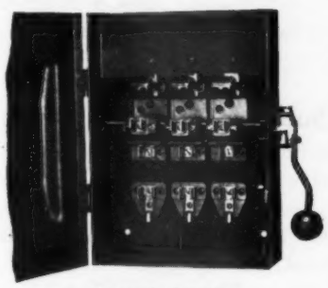
We admit that it is not easy to sell you a safety switch through advertising.

Primarily because you take what your distributor gives you.

They work all right and you are satisfied.

That's fair enough.

But supposing you had a chance to buy a line—a **complete** line of switches that were made to perform better than their classification calls for. Would you be interested? What about it? Well, the following lines of T-V Safety Switches are just that.



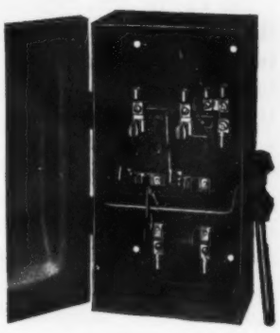
Current Breaker

T-V CURRENT BREAKER

Undoubtedly the finest safety switch made for industrial use. Unit construction, multiple contacts, minimum arcing and creepage, shielded parts, insulated handle. Breaks full rated load.

T-V TYPE C LINE

General all-service safety switch for every duty. Quick break, non interlocked and single throw. 30 to 600 amperes 125-250 volts, 30 to 2000 amperes 250, 500 and 600 volts.



"7000" Line

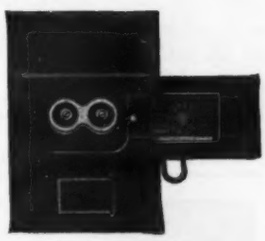
Type "C"

T-V 7000 LINE

Light duty switch for entrance use, residence lighting and power circuits. Has many advantages over other Type C Switches.

T-V METER SWITCHES

Our meter switch line is complete to meet every central station requirement.



Meter Switch

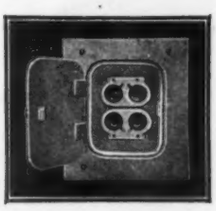
T-V FUSE PANELS

For easy and safe access to fuses for residence lighting circuits. Made in sizes for 2 to 12 circuits.

Knife Switches

T-V KNIFE SWITCHES

We make knife switches for every possible purpose. There you are. Prices are right, switches are right, deliveries prompt and most jobbers carry them. Just ask for T-V and note the difference.



Fuse Panel

Trumbull-Vanderpoel Elec. Mfg. Co.
BANTAM, CONN.

Boston New York St. Louis Chicago Philadelphia
Pittsburgh On the Pacific Coast—C. Dent Slaughter Atlanta

TV SAFETY SWITCHES

his cake, gave a share of it to the tax gatherer and then found that he shouldn't have had cake at all but should have been content with bread without butter.

* * *

Public Welcomes Reinspection*

By G. H. Parker, Manager Kentucky Actuarial Bureau, Louisville, Ky.

I am very much interested in the work of your Association and of the Code Committee, and while the results accomplished are little short of marvelous, it seems to me that the structure you are erecting is being torn down almost as fast as you build it.

Can you men claim to be efficient when, after laboring for years to develop an excellent code, after training the wiremen and after making many trips to a building under construction to see that the wiring is safe, you stop there? What are you doing to prevent the janitor, the porter or the engineer from hooking on to the circuits you have inspected, almost before the ink on your certificate is dry? In most cases, practically nothing.

You can go into almost any building that has been completed six months and find defective wiring because some would-be electrician equipped with a screw driver, a jack knife, a pair of pliers and some culled equipment from a Ten-Cent Store has been permitted to operate. I think you men should make every effort to correct this evil —and it is a growing evil.

Some of you may say: "My ordinance does not provide for periodical reinspection." And your ordinance never will until you make it your business to have the ordinance changed. The public knows nothing of electricity and it does not appreciate the hazard. It is your duty as electrical inspectors to point the way. As a matter of fact, you don't really need to change your ordinance. The average citizen—especially after he has gone to considerable expense to have the original work safely installed—will welcome your inspection, and if you present the subject to him properly in the great majority of cases he will gladly make the necessary changes.

I know, because it has been done elsewhere, and we have proved it in Kentucky. Last year we put on an electrical inspector in Louisville to devote all of his time to checking over old work, and we have made almost a perfect score. In very few cases have we found it necessary to report the building owners to the civil authorities. We have accomplished such wonderful results and the work met with such hearty approval from the public, that it is being extended to every town where we make original inspections. We have actually gotten hundreds of property owners in Louisville to have their wiring overhauled, without even promising them a reduction in their fire insurance rate—which is usually in order because before this work was started there were few mercantile buildings in Louisville that did not have a charge for defective wiring in the rate, even though there has been efficient inspection of new work by the city or by our bureau for many years.

I just referred to the culled equipment sold by many Ten-Cent Stores—and some of the chain drug stores and department stores are almost as bad offenders. Would it not be possible for this association to get behind a movement to require that all dealers in electrical supplies be licensed and that nothing but listed goods be sold? When you stop the sale of this defective equipment, I am confident that you will immediately find a distinct drop in your electrical fire loss.

*From address by Mr. Parker before International Association of Electrical Inspectors, Denver, Sept. 11, 1928.

Specializes in Residence Wiring:—H. C. Morlach, head of Reliable Electric Co., standing in front of his place at 3748 W. 25th street, Cleveland, O. He is equipped to handle all kinds of wiring, including important motor installations, and can tell you everything about residence wiring conditions in Cleveland.

* * *

Only Supervisor Needs License

An ordinance requiring the supervising of wiring work by master electricians licensed by the city was construed not to require the contractor to be licensed, provided the person actually supervising the work had a license (City of Shreveport v. Bayse, 117 So. 775).

The City of Shreveport, La., passed an ordinance making it compulsory upon persons supervising electrical work to first obtain a master electrician's certificate from the city authorities, and further provided that every master electrician should actually supervise all electrical work installed by him in the city. On failure to do so he was subject to a stated penalty.

The defendant in this case was charged with supervising electrical work without having qualified as a master electrician. The accused raised various objections to the validity of the ordinance, and, among others, he urged that the ordinance was unreasonable and primarily designed to prevent competition from electrical contractors not living in the city.

The ordinance was upheld. The court also held that under the ordinance an electrical contractor need not be a master electrician, provided the person actually installing and supervising the work had a master electrician's license, and anyone so desiring could comply with the requirements of the ordinance.

UMI

Type "NTA"
No-Thread Unilet

Type "NTC"
No-Thread Unilet

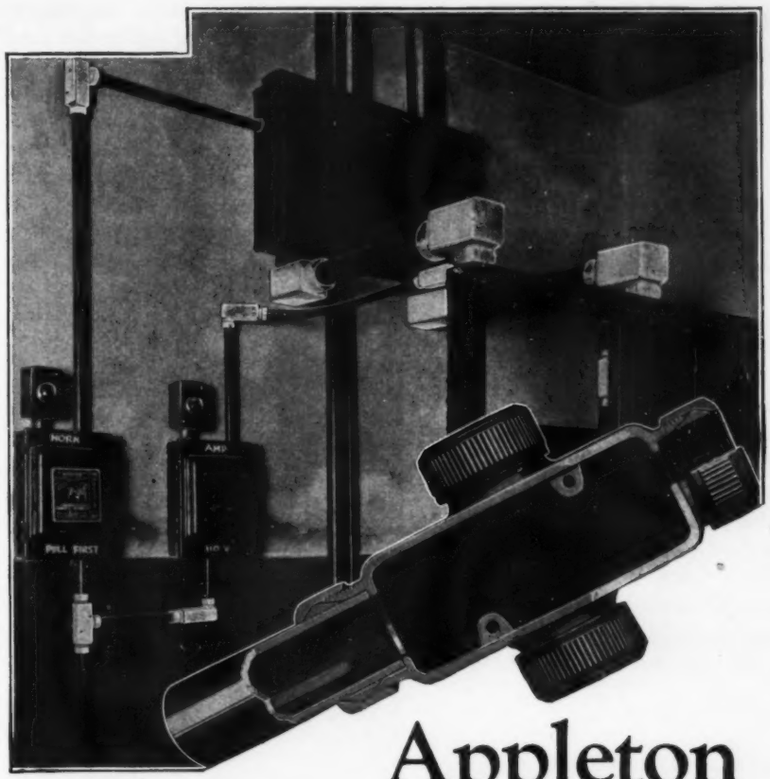
Type "NTE"
No-Thread Unilet

Type "NTLL"
No-Thread Unilet

Type "NTT"
No-Thread Unilet

No-Thread Coupling

No-Thread Connector



Appleton in the "Talking Movies"

Illustrated above is a Vitaphone and Movietone installation at the Howard Theatre, Atlanta, Georgia.

And here again—with this most modern of inventions—Appleton No-Thread Unilets were used.

There are no threads to cut, no time spent in threading—the No-Thread Unilet is inserted in the end of the conduit, the knurled nut is tightened with a Stillson—and that's all there is to it.

Every contractor should have literature telling about Appleton No-Thread Unilets. Write today.

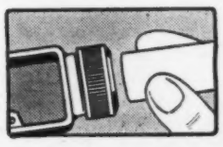
Appleton No-Thread Unilets are listed as Standard by Underwriters' Laboratories in ½" to 4" sizes, inclusive.

Sold through jobbers

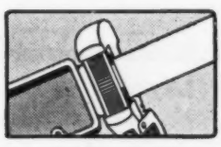
APPLETON ELECTRIC COMPANY
1704 *Wellington Avenue* • *Chicago, U. S. A.*

New York—150 Varick Street
San Francisco—655 Minna Street
Los Angeles—340 Azusa Street
Seattle—628 Railroad Avenue

1. Loosen nut



2. Insert conduit



3. Tighten nut

APPLETON UNILETS
Reg. U. S. Pat. Off.
and CONDUIT FITTINGS
STANDARD FOR BETTER WIRING

Storing Cable Reels That Arrive Too Early

R. M. Morganstern, Morganstern Electric Co., Pittsburgh, received a bill of lading for six reels of large cable to be used on a building job. Each reel weighed 2½ tons.

He knew that the big cable had to be fed from the first floor level of the building, also that some time would elapse before the work could be done. He knew that the only place the reels could be stored at the job was in the basement. This meant a gigantic task getting them down and bringing them up again when ready.

After a little fast figuring he simply sent the reels to a nearby warehouse where they could be rolled in and out with ease. The cost of the storage against the labor it would have taken to move down and up in the building proved he was considerably ahead.

* * *

Underwiring

This is the sad tale of a bad case of underwiring that shows the need of providing adequate conductors and illustrates the wicked waste resulting from continually patching up a defective installation.

Two motors were installed 10 years ago and from that time on gave constant trouble. The combination handy man and electrician was kept busy putting in fuses and tinkering to get the outfit going again. Aside from the annoying lapses in service and the expense involved the wear and tear on the motors was out of proportion.

When at last it was discovered that the conductors has been overloaded, the motor insulation was found to be practically baked to a turn and the motors pretty well shot.

* * *

Neat and Compact Industrial Switch Layout

An installation of industrial safety switches which is considered one of the finest in northern Kentucky is shown here as it is installed in the Duesing Ice Company plant located at Erlanger, Ky. It has caused widespread comment not only from the viewpoint of the wide variety of power machines that they control but also because of the neatness of installation and compactness of layout.

It was installed under the supervision of H. R. Liedy, electrical contractor, Florence, Ky., whose layout has eliminated very much of the disagreeable labor that is usually encountered on an installation of this kind. As a result of this job Mr. Liedy has secured two other installations of this type.

The plant of the Duesing Ice Company embodies the latest designed ice making machinery and electrical

H. R. Liedy

equipment. This plant has a capacity of three hundred and sixty 300-pound blocks of ice per every forty-eight hours.

The switches shown in the accompanying photograph were all made by the Wadsworth Electric Manufacturing Company and control the electrical equipment as shown in the accompanying table.

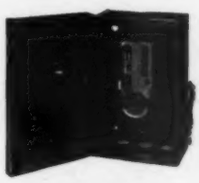
Functions of Industrial Safety Switches at Duesing Ice Plant

Switches or Cabinets	Functions
Pump Switches Nos. 1 & 2	Each switch 30 amp., 250 volt, 3 pole. Each controls a 5 h.p. motor which drives water pumps that force a spray on cooling system that reduces ammonia from a gaseous state to a liquid.
Pump Fuse	Contains fuses for pump switches Nos. 1 & 2.
Agitator Switch	60 amp., 250 volt., 3 pole. Controls two 5 h.p. motors that circulate a brine solution through ice machine tank.
Exciter Switches Nos. 1 & 2	30 amp., 250 volt, 3 pole. Control small A.C. motor used to excite the electrical field on two D.C. 50 h.p. motors.
Compressor Switches Nos. 1 & 2	600 amp., 250 volt, 3 pole each. Compressor Switch No. 1 controls a 50 h.p. motor and Switch No. 2 controls a 100 h.p. motor. These two motors furnish power for units which compress cold ammonia gas into a hot gas.
Compressor Switch No. 3	Controls 100 h.p. motor which acts as an auxiliary power unit and functions the same as the above two units.
Compressor Fuse	Contains fuses for Compressor Switches Nos. 1, 2 & 3.
Crane Switch	100 amp., 250 volt, 3 pole. Controls three 2 h.p. motors for lifting cranes used in hoisting and moving blocks of ice from molding tanks.
Blower Switch	100 amp., 250 volt, 3 pole. Controls a 10 h.p. motor that drives blower which forces air through ice tank during manufacture in order to clear ice and remove the sediment.
Transformer Cabinet	Controls transformer which controls current ratio.
Master Switch	1800 amp., 250 volt, 3 pole. Controls all circuits and current of the installation.
Power Meter Switch	Regular power meter switch.
Light Meter Switch	Regular light meter switch.

A Neat and Compact Switch Installation, Brings Contractor Other Similar Jobs

Another Step Toward Standardization

No. 5892
3 Pole
Meter Attached Ready
for Wiring
List Ea. $2.62



No. 5891
2 Pole
List Ea. $2.00

Three Switches In One

2 and 3 Pole Single Fusing 30 A.—125 V.

1—For use with Standardized Meters
(No special Meter Trims required).
Remove inner twistout in top end to accommodate new standardized 5-15 Amp. Meters.

2—For use with Special Meter Trims as used in Cincinnati.
Reverse top end (remove two screws) and remove outer twistout to accommodate trims which slide into place.

3—Not used with Meters.
Conduit knockouts are provided in top end as well as in other faces and back of box.

STANDARDIZATION

The fact that Meter Manufacturers have standardized on the size of meter terminal chambers enables us to offer one type of switch for several uses.

This type of switch, made both in 2 and 3 Poles, will accommodate the new 5-15 Amp. Meters of all manufacturers without the use of additional meter trimming devices. However, in certain localities where certain types of meter trims are specified, as in Cincinnati, this switch will fill the bill as explained above.

This switch also as it stands without removing twistouts fills the bill for either a 2 or 3 Pole Entrance Switch for which every contractor knows many applications.

THESE TWO SWITCHES SHOULD BE CARRIED IN STOCK BY EVERY CONTRACTOR

THE TRUMBULL ELECTRIC MFG. CO.

Plainville, Conn.

Branch Panelboard and Switchboard Factory at Ludlow, Ky.

NEW YORK
114 Liberty St.

PHILADELPHIA
Bourse Bldg.

CHICAGO
2001 W. Pershing Road

BOSTON
1002 Statler Bldg.

ATLANTA

SAN FRANCISCO
595 Mission St.

UMI

Noark

Meter Service

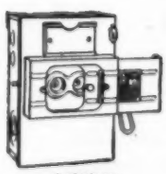
"Save yourself a lot o' trouble and work Here's what you need!"

Here's your main entrance switch! Here are your Meter Service Cabinets! There are your fittings; — pictures, diagrams, sizes and prices!

Just what your specification calls for and what the power company's code requires — Everything — right here in this **Noark Catalog No. 56** for every service entrance or meter service job you land.

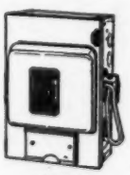
Why chase through a miscellaneous lot of price lists every time you want to make a purchase. You can't make money doing that.

Everything for a service entrance or meter service installation made by the organization which started the idea of standardized meter protection.



ACCO
30-60-100 ampere capacity. Load side fuses accessible.

UNIVERSAL
30 amp. Service entrance and facilities up to 4 branch circuits.

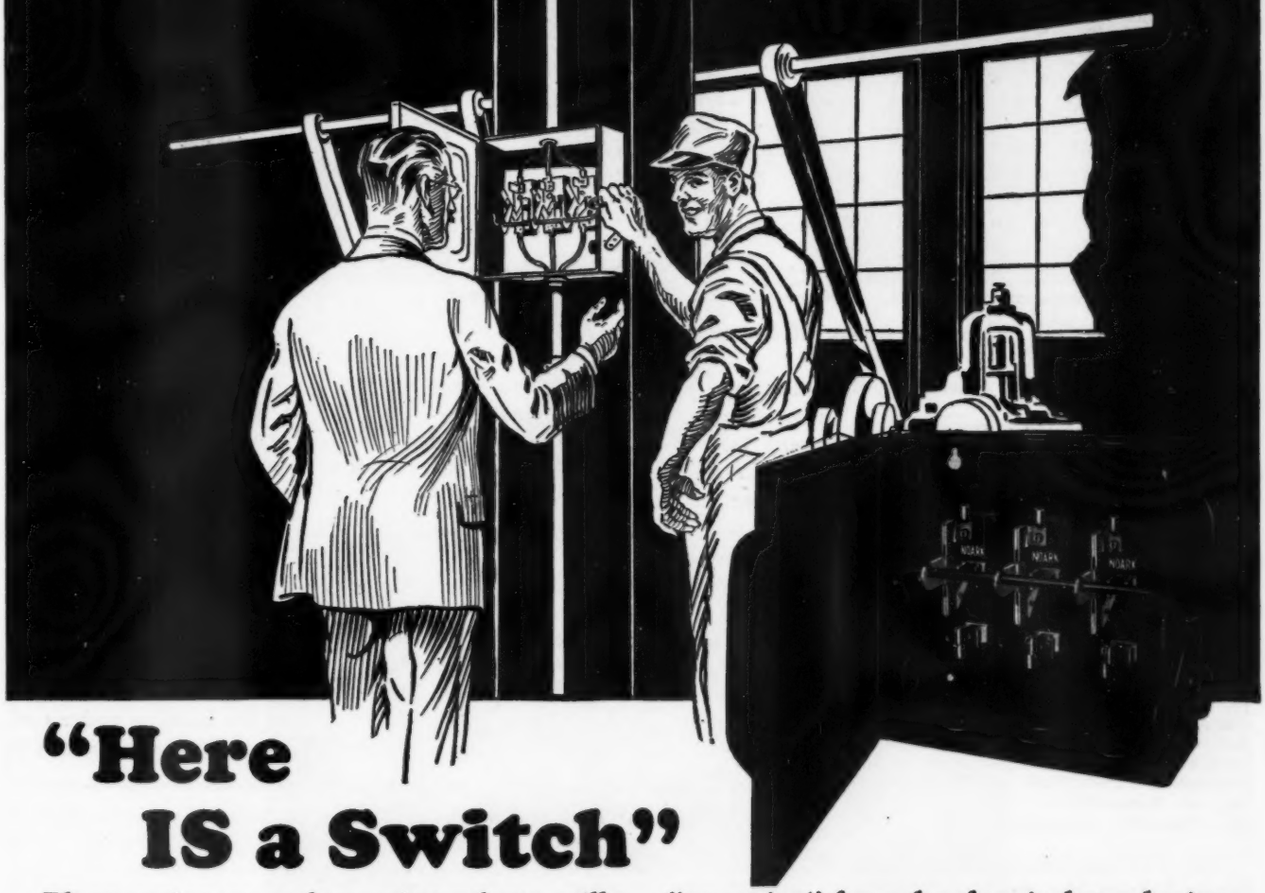


SECO
30-60-100 ampere capacity. All fuses sealed.

COLT'S PATENT FIRE ARMS MFG. CO.
ELECTRICAL DIVISION
HARTFORD, CONNECTICUT, U. S. A.
NEW YORK · BOSTON · PHILADELPHIA · PITTSBURGH · CHICAGO · SAN FRANCISCO 33-8-30

Noark

Nublade Switch



"Here IS a Switch"

Plant engineers and superintendents will quickly see the superiority of the Nublade Switch for general industrial service. They know the advantages of such new features as "quick break", "unit block", and "no-arcing" from the electrical standpoint, and they are equally conversant with the advisability of having all current-carrying parts dead and fuses readily accessible when the switch is open.

NUBLADE SWITCH

30-60-100 and 200 capacities 2-3-4 pole 250 volt AC or DC 500 volt AC Fused Non fused Solid neutral

Illustrated Price list giving specifications, dimensions, ratings, prices and all other information, on request

COLT'S PATENT FIRE ARMS MFG. CO.

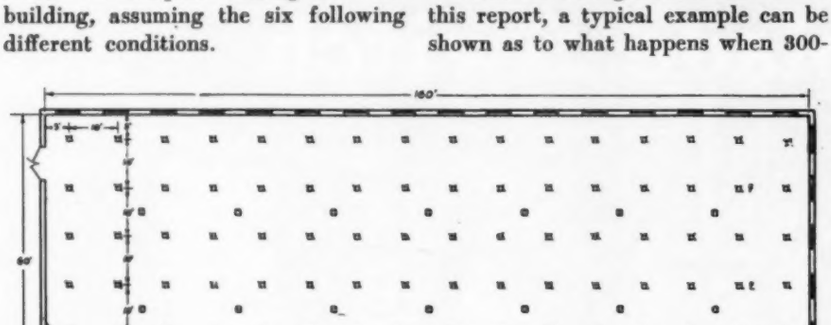
ELECTRICAL DIVISION

HARTFORD, CONNECTICUT, U. S. A.

NEW YORK BOSTON PHILADELPHIA PITTSBURGH · CHICAGO SAN FRANCISCO 28-N-3

The Economy of Adequate Wire Sizes*

IN order to make a study of the actual costs and lighting results of wiring, a plan for a new building showing the construction details and the lighting layout was sent to electrical contractors in five different cities. The plan view with the location of outlets, panel board, and service entrance is shown. The contractors were asked to submit cost estimates on complete wiring for this building, assuming the six following different conditions.



Plan View Giving All Locations

1. Each of the 96 outlets to be equipped with 1-100 watt lamp.
2. Each of the 96 outlets to be equipped with 1-150 watt lamp.
3. Each of the 96 outlets to be equipped with 1-200 watt lamp.
4. Each of the 96 outlets to be equipped with 1-300 watt lamp.
5. Each of the 96 outlets to be equipped with 1-500 watt lamp.
6. Each of the 96 outlets to be equipped with 1-300 watt lamp, disregarding entirely the two volt maximum drop and all other definite specifications as given for the preceding conditions, except that conductors must be placed in iron pipe conduit concealed in concrete, and the work must at least meet the requirements of the National Electrical Code for Electric Wiring, as recommended by the National Fire Protection Association.

Eleven different cost estimates were returned from the five cities. The bids were submitted in the form shown in Table I, which not only gives the cost data but also the sizes of wire to be used for typical branch circuits. The cost estimates given in the table are the averages obtained from the eleven different bids submitted. The wire sizes for typical branch circuits are the largest sizes specified by a majority of the bidders.

Lighting trends are upward. Larger sizes and more lamps will be installed as time goes on. In view of this fact, serious consideration should be given to the proper wiring of buildings at the present time in order to minimize not only immediate losses which result from inadequate wiring, but also greater losses which will inevitably occur when it is desired to employ larger lamps. In present lighting installations, the wattage is often as much as doubled without rewiring.

From the wiring data submitted for this report, a typical example can be shown as to what happens when 300-watt lamps are substituted for 150-watt lamps on a circuit originally designed for 150-watts per outlet. In order to find the magnitude of the losses for this typical example, it will first be necessary to analyze the cost of lighting, assuming that the building is wired in accordance with good practice for a 300-watt installation (System 4, Table I), and compare the losses with those which would be obtained when the 300-watt lamps are installed on the 150-watt per outlet system (System 2). The wire sizes shown in Table I for the 300- and 150-watt lamps were used in the calculations. It was assumed that the lamps would be burned 1500 hours a year at an energy rate of 5 cents per kilowatt hour.

Analysis of System No. 4

Using the wire sizes No. 12 and No. 10 as recommended by the bidders, the lamps burn at normal voltage. Thus 100 per cent or normal life, wattage and light output are obtained. The annual energy cost amounts to

$$96 \text{ outlets} \times \frac{300}{1000} \text{ kw.} \times 1500 \text{ hrs.} \times 5\text{c.} = \$2.160$$

The cost of lamps was figured at the net price obtained on a $600 consumer lamp contract. It was assumed that this size of lamp contract would be fulfilled since the building under consideration was defined as an annex to

Table II. Computations for Voltage Drop and I^2R Loss for System No. 4, 300 Watts per Outlet, 1200 Watts per Circuit, 115 Volts, 10.44 Amp. per Circuit. $I^2 = 109$.

Typical Branch Circuits	Wire Size	Load Center Feet	Ohms R	I R Drop per Circuit Volts	I^2R Loss per Circuit Watts	No. of Branch Circuits	All Circuits: I R Drop Volts	All Circuits: I^2R Loss Watts
A	12	24	0.076	0.794	8.3	2	1.588	16.6
B	12	42	0.1334	1.392	14.52	4	5.68	58.08
C	10	62	0.124	1.296	13.5	6	7.776	81.0
D	10	82	0.164	1.712	17.9	6	10.272	107.4
E	10	86	0.172	1.795	18.75	4	7.180	75.0
F	10	95	0.190	1.985	20.7	2	3.970	41.4
			Totals	....	....	....	36.354	379.48

Average voltage drop per circuit—1.5.

Cost of Energy loss $= \frac{379.48}{1000} \times 1500 \text{ hrs.} \times 5\text{c} =$ $28.46.

Table I. Average Estimates Submitted by Eleven Electrical Contractors

System	Wattage per Outlet	Outlets per Circuit	No. of Branch Circuits	Wire Sizes To Be Used: Three-wire Feeder	Typical Branch Circuits Panel Board to Bays (see blueprint): A	B	C	D	E	F	Cost to Owner for Complete Jobs*: Material	Labor	Total
(1)	100	8	12	4	14	14	12	12	10	10	$367	$293	$660
(2)	150	8	12	2	12	12	12	12	10	10	405	313	718
(3)	200	4	24	1	14	14	14	12	10	10	455	375	830
(4)	300	4	24	00	12	12	10	10	10	10	545	409	954
(5)	500	3	32	250,000	12	12	10	10	8	8	704	505	1209
(6)	300	4	24	00	14	14	14	14	14	14	424	373	797

*What is labor rate per hour? $1.50. About what per cent overhead and profit has been assumed in arriving at owner's cost? 15 and 10?

*From the Lighting Service Manual, Part III, National Electric Light Association, dated August, 1928.

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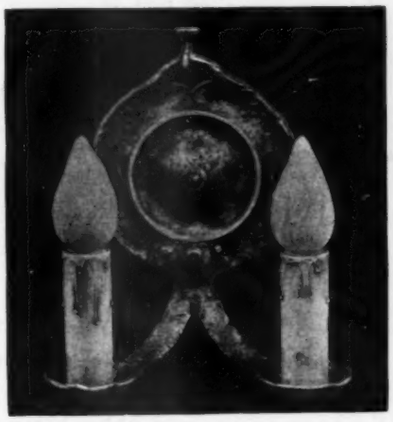

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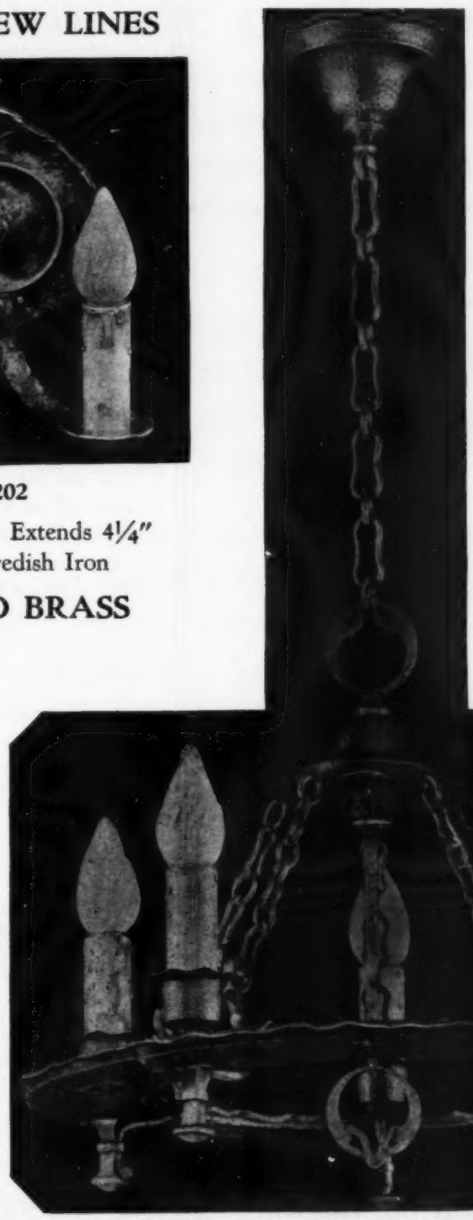

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a larger building. The annual lamp cost for 300-watt lamps for this layout is

$$96 \times \$0.95 \times \frac{1500}{1000} = \$136.80$$

The loss due to current overcoming resistance (I^2R) in this case amounts to $28.46 annually as shown from Table II. This cost, added to energy and lamp costs, brings the total annual operating cost to

$$\$2,160 + \$136.80 + \$28.46 = \$2,325.26$$

From this system of lighting the lumen hours of lights obtained is

$$96 \times 5300 \times 1500 = 763 \text{ million lumen hours}$$

When the lamps are operating at normal voltage—115 volts—the voltage drop averages 1.5 volts (Table II). The voltage at the panel board is, therefore, 116.5 volts.

Analysis of System No. 2, Assuming 300 Watts Per Outlet

If the 300-watt, 115 volt lamps are operated on circuits designed for 150-watts per outlet, we find that the average voltage drop is 4 volts (Table III). Since the normal panel voltage is 116.5 volts, the lamps will be operating at 112.5 volts or 2.5 volts below their rated voltage. This also reduces

TABLE III. Computations for Voltage Drop and I^2R Loss for System No. 2 When 300 Watt Lamps Are Installed. 2400 Watts per Circuit. 20.9 Amperes per Circuit. $I^2 = 436$.

Typical Branch Circuits	Wire Size	Load Center Feet	Ohms R	I R Drop per Circuit Volts	I^2R Loss per Circuit Watts	No. of Branch Circuits	All Circuits	
							I R Drop Volts	I^2R Loss Watts
A	12	49	0.155	3.24	67.6	2	6.48	135.2
B	12	58	0.184	3.84	80.2	2	7.68	160.4
C	12	68	0.216	4.52	94.2	2	9.04	188.4
D	12	78	0.247	5.16	107.5	2	10.32	215.0
E	10	87	0.174	3.64	76.0	2	7.28	152.0
F	10	97	0.194	4.05	84.6	2	8.10	169.2
			Totals	....	....	....	48.90	1020.2

Average voltage drop per circuit—4.0.

Cost of energy loss $= \frac{1020.2}{1000} \times 1500$ hrs. $\times 5c =$ $76.52.

an annual saving in operating cost of $2,325.26 — $2,267.14, or $58.12, there is a loss in light of 53 million lumen hours. Since the cost per million lumen hours from System 4 is the lamp wattage to 96.6 per cent of normal and the lumen output to 93 per cent of normal, while the life is increased 33⅓ per cent.

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Extended guide clamp and "T" connector

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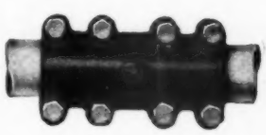
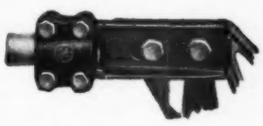


Straight connector

Bus hanger



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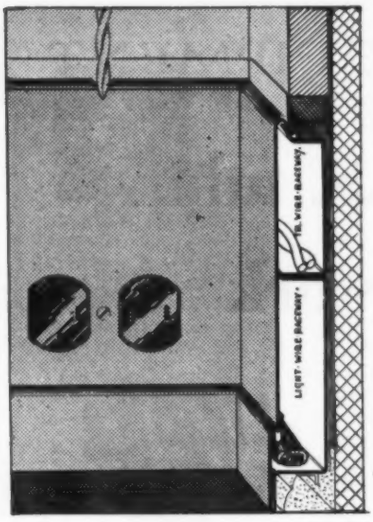

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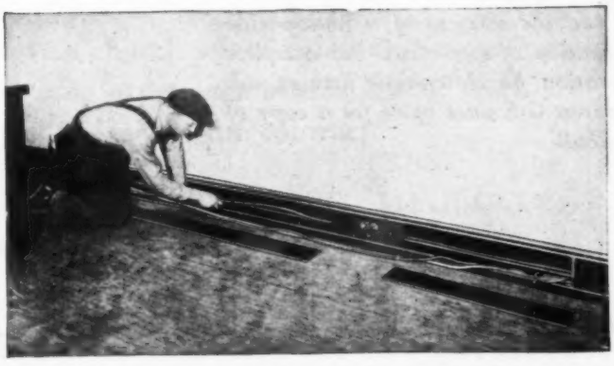

Doing Modern Hospital Installation:—E. C. Carlson, head of the Carlson Electric Co., Youngstown, O., with two of his boys at the newly built addition to St. Elizabeth's Hospital, on which he is doing the electrical work. This job embraces all the latest wrinkles in hospital wiring, especially in the matter of call signals for doctors and nurses. The work was not far enough advanced for inside photographs, but we hope for some later.

$2,325.26 ÷ 763 or $3.05 then the cost of light lost in System 2 is

$$53 \times \$3.05 \text{ or } \$161.65$$

This amount minus $58.12 gives a net loss of $103.53 due to inadequate wiring.

From the installation cost estimates for Systems 2 and 4 as given in Table I, it is found that System 4 costs $236 more than System 2. It is, therefore, seen that by an added initial investment in this case of $236 for better wiring, an annual saving of $103.53 in light is obtained during the time when the wattage might be doubled. Since this is a typical instance, it may be more useful to express these costs in terms of dollars per outlet.

To wire so as to insure enough copper in the circuits for 300 watts per outlet to minimize losses, costs $9.93, or approximately $10 per outlet. The cost of wiring for only 150 watts per outlet is approximately $7.50. The better wiring, therefore, will cost $2.50 more per outlet, but will insure the system against an annual loss of $1.10 per outlet.

It is also a fact that, during the time when the initial installation of 150-watt lamps is used, light would be produced more economically from a wiring installation designed to accommodate the higher wattage lamps. It can, therefore, in general be concluded that an initial investment of a

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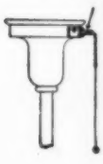

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The annual energy cost amounts to

$$96 \text{ outlets} \times \frac{290}{1000} \text{ kw.} \times 1500 \text{ hr.} \times 5\text{c.} = \$2{,}088.$$

The cost of lamps is

$$96 \times \$0.95 \times \frac{1500}{1333} = \$102.62$$

The I^2R loss from Table III is $76.52.

The total annual operating cost for this system is

$$\$2{,}088 + \$102.62 + \$76.52 = \$2{,}267.14$$

From this system of lighting the lumen hours of light obtained is

$$96 \times 4930 \times 1500 = 710 \text{ million lumen hours}$$

From the foregoing analysis of Systems 4 and 2, it is found that for few extra dollars in the wiring system will pay an exceptionally high dividend when the standard of illumination is increased by installing higher wattage lamps.

Code No Guide

In making wiring specifications, many electrical contractors and builders consider the current carrying capacity of the wire as a criterion for wire sizes. The wire sizes so specified in the National Electrical Code are intended only to regulate the installation of electrical apparatus so that fire risks would be minimized. The Code should, therefore, only be considered as a guide to safe carrying capacity of wires, but not as a guide to economical distribution of energy.

The effect of cutting down mate-

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Pittsburgh Pennsylvania

rials to save costs is illustrated by again using the 300-watt installation as an example.

Analysis System 6

Referring to Table I, System 6, the average figures submitted for this installation by the eleven contractors are given. In this case, as noted before, all definite specifications were disregarded, it being necessary only to meet the requirements of the National Electrical Code for wiring.

From the computations already made on System 4, we found that the voltage at the panel board was 116.5 volts. When operating on the smaller wire sizes as specified in System 6, the average voltage drop is 3.5 volts (Table IV). The lamps on this system are, therefore, burning at 113 volts. At this voltage, the wattage of the lamps is 97.5 per cent of normal and the lumen output is reduced to 94 per cent of normal. The life of the lamps is increased to 125.8 per cent.

TABLE IV. Computations for Voltage Drop and I^2R Loss for System No. 6, 300 Watts per Outlet, 1200 Watts per Circuit, 115 Volts, 10.44 Amperes per Circuit. $I^2 = 109$.

Typical Branch Circuits	Wire Size	Load Center Feet	Ohms R	I R Drop per Circuit Volts	I^2R Loss per Circuit Watts	No. of Branch Circuits	All Circuits: I R Drop Volts	All Circuits: I^2R Loss Watts
A	14	21	0.1212	1.268	13.2	2	2.536	26.4
B	14	42	0.212	2.216	23.1	2	8.864	92.4
C	14	62	0.313	3.27	34.1	6	19.62	204.6
D	14	82	0.414	4.32	45.2	6	25.92	271.2
E	14	86	0.434	4.54	47.3	4	18.16	189.2
F	14	95	0.480	5.02	52.4	2	10.04	104.8
			Totals	....	....	....	85.14	888.6

Average voltage drop per circuit—3.5.

Cost of energy lost $= \frac{888.6}{1000} \times 1500$ hrs. $\times 5c =$ $66.64.

The annual energy cost amounts to $2,102.40. The cost of lamps is $108.74. The I^2R loss is $66.64 and the total annual operating cost for this system is $2,277.78.

From this system of lighting 717 million lumen hours of light is obtained.

By comparing the foregoing analysis with that of System 4, we find that for an annual saving in operating cost of $2,325.26—$2,277.78, or $47.48, there is a loss in light of 46 million lumen hours. Since the cost per million lumen hours from System 4 is $3.05, then the cost of light lost in System 6 is $140.30. This amount minus $47.48 gives a net loss of $92.82 because of inadequate wiring.

From the installation cost estimates

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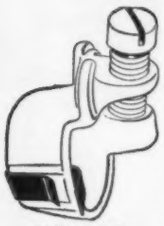

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City ..... State.....

Contracting Management Advisor: John Kuhlemeyer, well known for his work amongst electrical contractors and more particularly for his efforts in organizing the electrical contractors of Youngstown, Ohio, Chattanooga and Knoxville, Tenn., has opened offices at Maywood, Ill., as counsellor and advisor in business management for electrical contractors and in industry relations. Mr. Kuhlemeyer intends to specialize in the promotion of local associations of electrical contractors and dealers.

for Systems 4 and 6, Table I, it is found that System 4 costs $157 more than System 6. It is evident, therefore, that by an added initial investment of $157 for proper wiring, an annual saving of $92.82 in light is obtained. In other words, for an added initial investment of $1.64 per outlet a return of $0.96 per outlet will be obtained each year.

Conclusions

With the levels of illumination increasing year by year as demanded for various interiors, it is today of primary importance to make provision for higher wattage than may be demanded for present installations. It is believed to be entirely practical in wiring new buildings to provide at least a 100 per cent safety factor, that is, making provision for double the wattage actually needed at present. If this provision is not made, the losses encountered when higher wattage

A TWO-SIDED ADVANTAGE IN THE CLP PANELBOARD

BETTER FOR YOU

OWNERS of residences, apartments, apartment hotels, or any place where 110-220 volt power is or may be used, are prospective customers for the new CLP panelboard--and a bigger and better wiring job.

This Westinghouse control cabinet gives the electrical contractor an opportunity for a legitimate additional profit, as it simplifies the installation and lessens the wiring costs wherever light and power circuits are combined.

The CLP panelboard can be used to install wiring for all future needs with little additional expense or effort on the part of the contractor. Use it to obtain an extra profit on your wiring job.

Ask for Leaflet 20367.

BETTER FOR USERS

IN this day of electrical servants for the home, the panelboard should be installed in a convenient place.

The Westinghouse CLP panelboard can be mounted in the kitchen, hall, or any other convenient place without marring the beauty of its surroundings. A flush-type trim, which can be decorated to match the wall in which it is set, assures an inconspicuous, but ever-ready source of control for all the electrical circuits of the house.

Lights, range, water heater, refrigerator, now can all be fed through one panelboard. Show your customers how the CLP panelboard makes it possible to meet future wiring requirements at a slight additional expense.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania

Sales Offices in all Principal Cities of
the United States and Foreign Countries

Westinghouse

T 30127

UMI

REYNOLITE

TRADE MARK REG. U.S. PAT. OFF

Announces

Too many places are poorly lighted, in spite of lavish expenditure on lighting. Inefficient equipment wastes light. Reynolite Floodlights throw properly distributed beam of light on the space or object to be illuminated, giving the maximum effect, and

FLOOD-LIGHTS

Which will help you profit by the growing popularity of floodlighting for safety, beauty, and utility. Jobbers will soon show you bulletins and samples.

No Wasted Light!

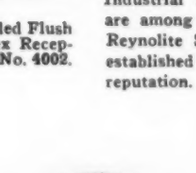
WIRING DEVICES *and* SIGNALS

Moulded Flush Duplex Receptacle No. 4002.

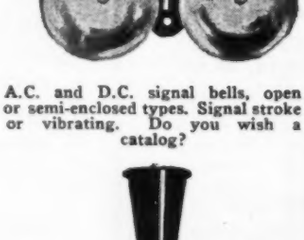
Reynolite Bakelite wiring devices are practical for the modest home, but will harmonize with the finest surroundings. Special patterns made to your order.

Industrial Plants, schools, garages are among the many prospects for Reynolite Signal Devices. An old established line with a wonderful reputation. Now sold by Reynolite.

A.C. and D.C. signal bells, open or semi-enclosed types. Signal stroke or vibrating. Do you wish a catalog?



Moulded push buttons. Red buttons. Round No. 900. Octagon No. 901. More elaborate designs are available.



Reynolite Horns are in single, two-way and three-way types. Clear penetrating tones. A really superior signal for many purposes.

For the utmost satisfaction in every particular use and specify Reynolite Products.

Reynolite Division

REYNOLDS SPRING CO.

JACKSON, MICH.

lamps are installed will very soon offset the extra initial wiring cost for the higher wattage. From the analysis of Systems 2 and 4, it is found that when 300-watt lamps are installed in a system designed for 150 watts per outlet, the losses will, in slightly over two years, entirely offset the extra initial cost of wiring for the higher wattage lamps.

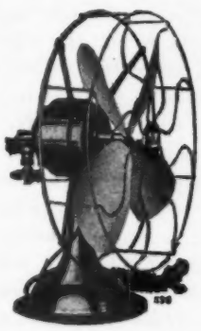
There are many "overloaded" lighting systems in use today which are costly to the owner because he is often unknowingly paying for a considerable amount of light which he never receives. Many of the buildings with these overloaded lighting circuits can well afford to rewire immediately, as the money invested would pay a good dividend. It is, of course, true that in those buildings where the existing outlets are improperly placed or are not sufficient in number to insure uniform distribution of light throughout the room, a rewiring job is doubly imperative.

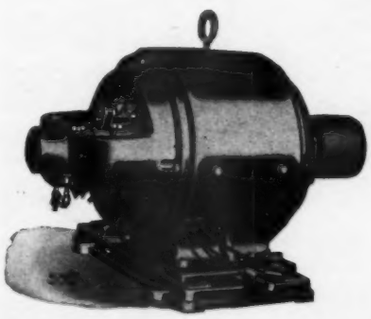
It should be noted particularly that the cost of estimates given in Table I are for wiring a new building and are, no doubt, in general, somewhat lower than those for rewiring an old build-

Manager of Youngstown Association:—Many will recognize Lloyd M. Robinson, manager of the Electrical Contractors Association of Youngstown, O. He is a former contractor, knows all the angles, and is leaving no stone unturned to promote better business. He is justly enthusiastic over the way the Youngstown folks are pushing several progressive movements.

R & M

There's Money in that Name— *for You!*





WHENEVER you have heard Robbins & Myers Fans or Motors mentioned it has been favorably—because for thirty years only the highest quality obtainable has been tolerated in R & M Products. Consequently there has grown up around the name a reputation that means popularity, volume, and profit to the dealer.

It is not too early to begin thinking about the campaign you will run on fans next year. Would you like to receive our bulletins?

There are, too, many opportunities for the alert contractor-dealer to sell small motors. Here again, you can place all your confidence in R & M Products, for they will bear out your judgment, and help to build sound profits for you.

Robbins & Myers, Inc.

Springfield, Ohio

EXPECT GREAT THINGS

in the improved sectional type

They will measure up to your expectations

Inbuilt quality and superior design have always characterized Wurdack Panel Boards. But these improved sectional panels, with their many advanced features, set a new standard in panelboard construction. Consider these outstanding features:

- All parts are removable from the front. Ready access is provided to switch mechanism and fuse connections. It is especially easy to replace copper shell or contactor screw when these become badly burned from short circuit or heavy overload.
- All new tumbler switches are rated 30 ampere, 250 volts and are heavy duty type, with mechanism and contact parts capable of most severe service. Single pole tumbler switches are equipped with Bakelite arc snuffers lengthening life and increasing breaking capacity. Blades are self aligning with contacts. The entire steel frame and switch mechanism is thoroughly rust-proofed.
- Entire back of sectional panel is covered with a continuous steel plate, which guards against injury during installation, and always keeps mechanism of switches free from dust and dirt.
- Panel is secured in cabinet by means of four special mounting studs, which permit adjustment both in-and-out and laterally. The arrangement is such that adjustment can be made after panel is installed without the use of any special tools.
- All-steel fronts, of heavy guage sheet, are smooth and flat and carefully finished in genuine black lacquer. Easy to keep clean and neat in appearance.

Assure satisfaction to both your client and yourself by installing Wurdack Panel Boards on your next job. Investigate their merits . . . Write for latest catalog.

WM WURDACK ELECTRIC MFG. CO.

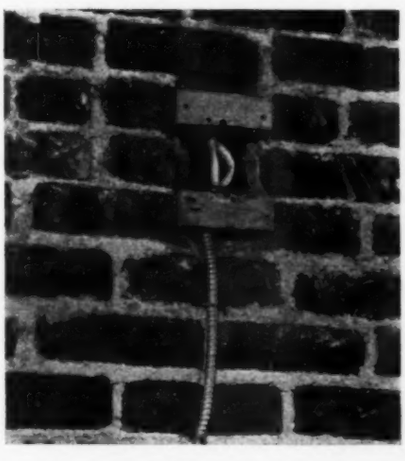
4444 CLAYTON AVE., ST. LOUIS, MO.

ing. Where plaster has to be renewed, concrete channelled, or similar work done to install wiring, the cost obviously is increased. Referring again to comparative cost analysis of Systems 2 and 4, it is seen that there is an annual saving of $106.15, or $1.11 per outlet for the 300-watt system. Even if this were the only benefit to be gained, it would readily justify a rewiring expense which might even be considerably greater than the $9.93 per outlet as estimated for a new building. However, the value of illumination is not limited to its intrinsic worth, but even greater, its value to good vision and attractiveness of the room. In a factory workroom or store this latter value alone may easily be such as to pay for the rewiring cost many times.

From every viewpoint, then, it is reasonable to conclude that where excessive voltage drop exists, the cost of rewiring is unquestionably justified.

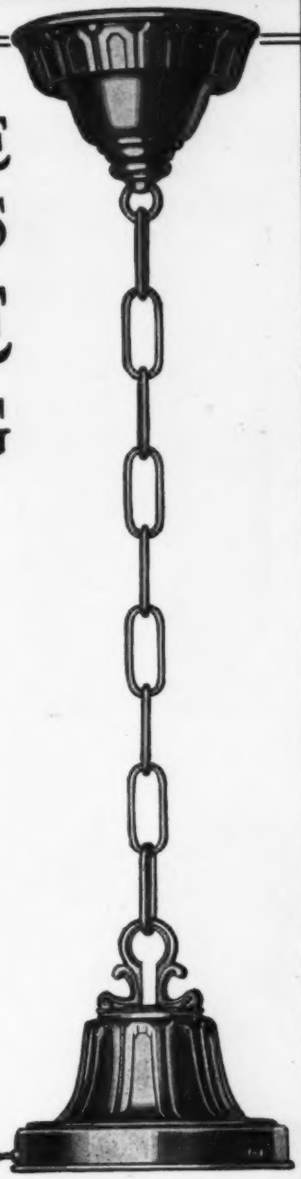
Efforts to cut down wiring specifications which would otherwise insure against losses in light and energy, instead of creating a saving, eventually incur a greater expense. From the analysis of the cost data for Systems 4 and 6 in Table I, it is found that for the latter system, where the initial wiring cost was cut to a minimum, the cost of light lost in approximately 1½ years would equal the extra cost required for installing a good wiring installation.

Fastening Outlets to Brick Walls



When installing wall outlets on brick a solid job can be made by chipping out the brick and fastening two short pieces of backing on the bricks with nails. The box may then be screwed to this backing and the cable attached.

GENUINE BRONZE "RED SPOT" HANGERS COST NO MORE ON THE CEILING



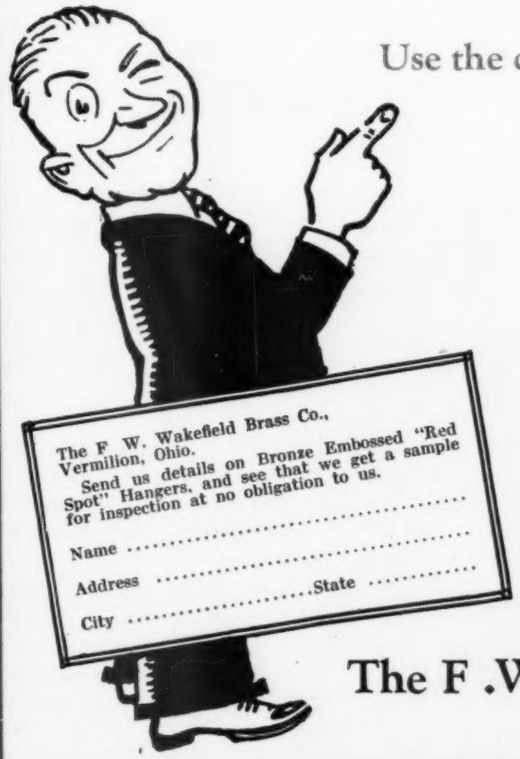
DON'T get fuddled between *price* and *cost*. *Price* is the figure on your jobber's invoice. *Cost* is what you pay to get the hangers on the ceiling.

Cock-eyed screw threads, unreamed wireways, missing parts, damage in handling, and no room for your wireman to work when installing, all add to *cost*.

Time-saving is *built into* Wakefield Bronze Embossed "Red Spots." You can buy *cheaper* hangers, of course, but "Red Spots" *cost no more on the ceiling*.

You ask us to prove it? Get a sample and *prove it to yourself*.

Use the coupon


The F W. Wakefield Brass Co.,
Vermilion, Ohio.
Send us details on Bronze Embossed "Red Spot" Hangers, and see that we get a sample for inspection at no obligation to us.
Name .....
Address .....
City .....State .....

The Bronze Embossed "Red Spot" Hanger is finely proportioned — handsomely embellished with rich, deep embossing — dignified and solid in appearance. You have only to look at a sample to understand why this fixture sells so easily.

The F .W. WAKEFIELD BRASS CO.
VERMILION, OHIO

No. 499 Midget Floor Receptacle.

"Fullman" *another word for* Floor Boxes

So popular are these "Steel City" products that it is almost second nature for a contractor to say "Fullman Boxes" when he refers to floor boxes.

The Fullman Midget, shown at the left, recently introduced, is the smallest approved floor outlet on the market. It is ideal for residences, show windows and radio installations.

Every wiring job offers possibilities for using Fullman Floor Boxes, which meet every service condition.

No. 469

No. 466

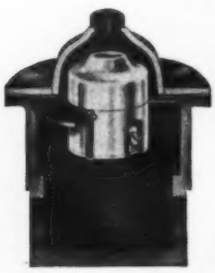
No. 467

No. 465

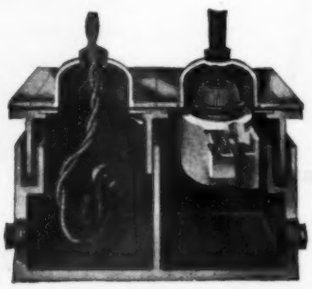
No. 468

Steel City Electric Co.

PITTSBURGH, PA.



No. 477 outlet with Hubbell receptacle on steel ring.

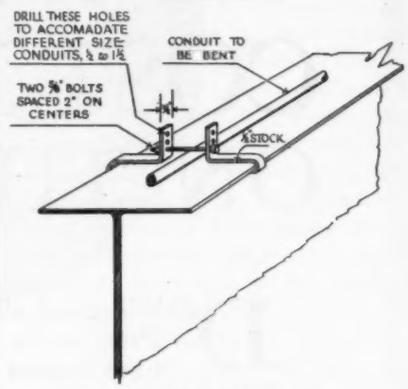


No. 422 Adjustable Floor Outlet with two No. 459 cover plates.

A Beam Clamp Conduit Bender

All fireproof buildings are wired principally in rigid conduit and in the case of a large building a great many bends are imperative and must be made quickly and properly.

A conduit bender can easily be made which will serve nicely for conduits



Conduit Bender

up to say 1½ in. and is of such a character that it may easily be taken from floor to floor and clamped on any of the floor beams quickly. It is a beam clamp with a spacer.

The diagram shows the clamp in place also the respective parts. The spacer may be made of either iron, steel or some very hard wood like oak or maple, and there should be two or three different size spacers depending on the size of conduit to be bent.

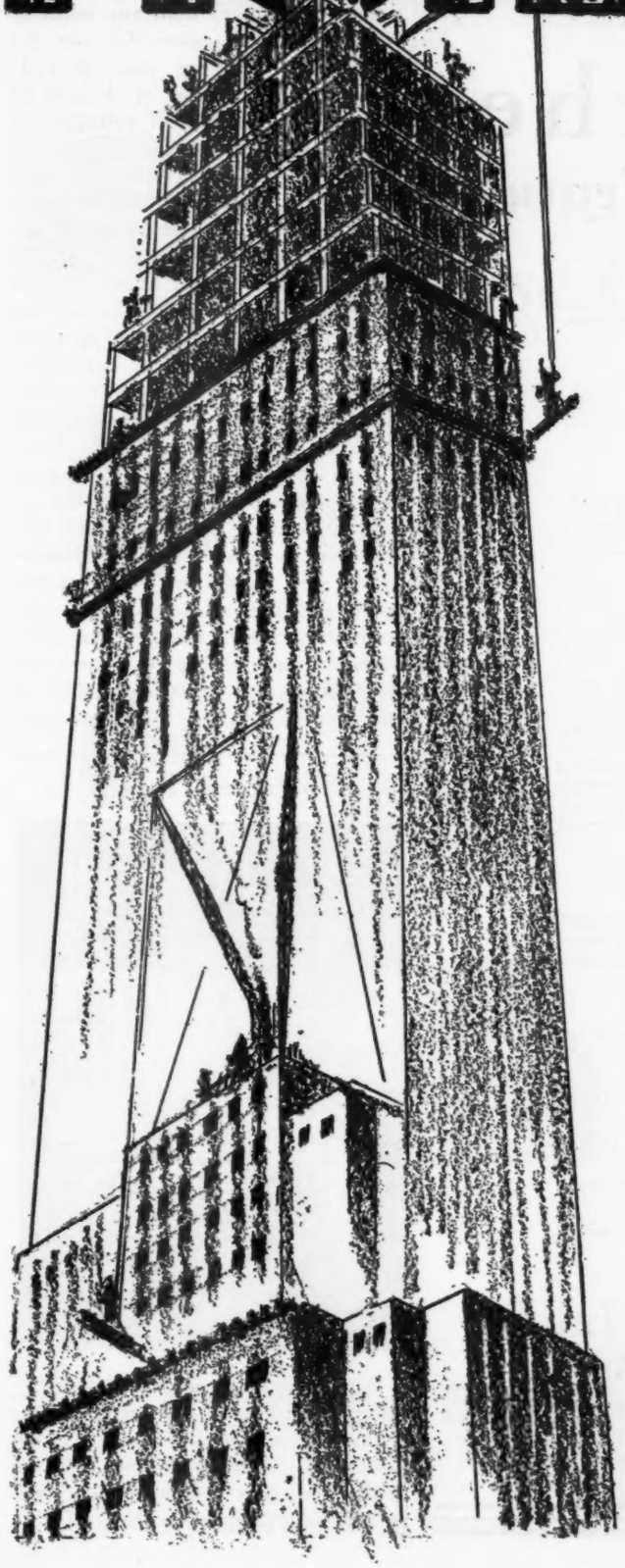
Right to Replevin Lighting Fixtures

The law is well established that a seller may legally replevin his property which is in the wrongful possession of another individual. However, there are many things to consider in determining whether a contractor may replevin lighting fixtures for which the purchaser or owner of a building refuses to pay.

Of course, a signed agreement, by which an owner of property engages a contractor to perform work, is a written contract which is controlled by the laws that relate to other written instruments.

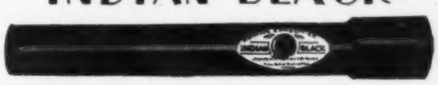
Therefore, if the contract between a contractor and an owner is such that the latter agrees to permit the former to repossess fixtures, under stipulated conditions, the agreement being one of legal nature is valid and enforceable. This point of the law was discussed in the case of Parkstone Apart-

MOHAWK



INDIAN WHITE

INDIAN BLACK



REWARD

THE reward of Public Favor is gained by those contractors who constantly strive for perfection.

That Mohawk has gone far along the road to this goal is best shown by the fact that the matter of providing conduit for many of the big jobs of the year is entrusted to our care.

Smooth finish; tough glossy enamel.
Pipe bends so easily you hardly realize it is steel.
Clean, even threads that make work a joy.

Mohawk may be had in either Indian Black (enamel) or Indian White (galvanized). Ask your jobber or your nearest Mohawk Conduit Company branch.

MOHAWK
CONDUIT CO. *INC.*
COHOES. NEW YORK
BRANCH OFFICES: CLEVELAND-ST. LOUIS-SAN FRANCISCO
NEW YORK-CHICAGO-DENVER-LOS ANGELES
SEATTLE-BOSTON-NEW ORLEANS

SAUTER
Electric
Time Switches
have many Superior Features

Precision Clock Movement

Specially built, powerful, rugged clock movement. Large escapement unit fully jewelled and impervious to temperature variations.

Sunday Cut-out

Most Sauter switches can be furnished with special 7-day dial for omitting all Sunday operations.

Astronomic Dials

They reset the daily switching operations to conform to the gradual change of local sun time, wherever the time switch operates a lighting circuit, either on all-night or a part-night schedule.

Upon request we furnish free, convenient graphic sunset and sunrise schedule for your locality.

Universal Electric Motor

For winding clock movement and operating switch; runs from 20 seconds per day in the smallest switch to 3 minutes per day in the largest. It consumes *less than 5 cents worth of current per year.* For the larger types (10 ampere up) it serves also to wind a separate powerful switch mainspring, which provides ample power for quick make and break of the switch. The motor is series universal 115-230 V., A.C., or D.C., suitable for any commercial frequency.

Long Lived Contacts

High rupturing speed, self wiping action, heavy contact pressure in closed position, are chief features which guarantee lasting dependability, even under severest conditions.

A Complete Line

Ranging in capacities up to 300 amperes for circuits of not over 250 volts, and up to 50 amperes for circuits not over 8000 volts.

Each is designed for *continuous operation* with *least supervision.*

14 day movement requires attention only at 14 day intervals.

40 day movement requires attention not oftener than once a month.

Electrically wound group requires no manual winding at any time.

R. W. Cramer & Co., Inc.

136 Liberty St., New York, N. Y.

ALL APPROVED BY UNDERWRITERS' LABORATORIES.

Special attention given to special requirements. Inquiries should state voltage and amperage of circuit to be controlled, program of operation, and whether installation is outdoor, indoor or underground.

ment Co., 220 N. W. 780, decided during the past few weeks. In this case it was disclosed that a contractor-dealer had installed electrical fixtures in an apartment building under a contract which provided:

"It is agreed that title to the above described property remains in the seller (contractor) until any notes or renewals thereof taken for the deferred payments are paid in full; .....that in case of default in any of the payments of principal or interest, when due as above specified, and for 10 days thereafter, the said first party (contractor) shall thereupon forthwith have the right to declare this contract at an end, and to take immediate possession of said above-described property, as well as all the payments of principal or interest which shall belong to and be retained by said first party (contractor) as liquidated damages for nonperformance of this contract....."

Soon after the building was completed and before the contractor received payment, a receiver was appointed to dissolve the corporation which was formed to construct the building. The receiver of the corporation contended that the contractor was not legally entitled to remove the electrical fixtures because the title to the same had passed to the corpora-

To Prevent Tangles

When winding coils on the armature the wire will not easily tangle if the reels are mounted overhead as illustrated. The reels are held on small iron rods which are slipped through pipe hangers on the joists.

You'll *always* ask for CST Fittings

[The Superior Line]

No. 1202

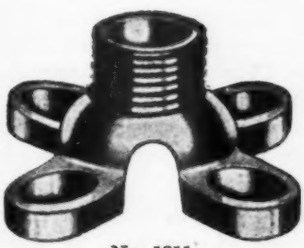
once you've tried them—*Because* they are

No. 601

No. 1102

No. 901

No. 1152



No. 1311

No. 901

Really Superior Fittings

Every lockout, bushing, connector, and every other item is guaranteed. Perfect threads, perfect galvanizing —every piece you pick up—with your eye closed—will *fit* without forcing. *No discards.*

In Handy Unit Packages

It is obvious that there is a great advantage in being able to get just the quantity you desire in a handy carton.

N. E. C. Standard

Every CST item is guaranteed to conform to the N.E. Code. Any piece found defective will be replaced without charge.

Same Day Shipments

Warehouse stocks at convenient points all over the country enable you to obtain orders immediately. All you need to know about a fitting is that it's CST.

CST *Sold through Jobbers*

CHICAGO STEEL TANK COMPANY

ELECTRICAL DIVISION

6400 West 66th Street **CHICAGO, ILLINOIS**

3/8 to 2½ inches

Minerallac Cable and Conduit Hangers

Japanned or Galvanized

These hangers are made of spring steel and are much stronger than cast iron hangers. They are easily and quickly put in place and open wiring conduit and cable may be run with greater rapidity than by the use of other hangers and it, also, allows a more compact arrangement.

Minerallac Hangers have been approved by the Underwriters Laboratories for use on circuits up to 300 volts when mounted directly on the surface wired over. For voltages from 300 to 550 volts—these hangers must be installed with spacers under the base of the hanger or mounted on metal racks or brackets so as to hold the conductors at least 1″ from the surface wired over. For voltages above 550 volts—the hangers should be used with insulating bushings having the necessary insulation strength. In this case, also, hangers should be mounted on metal racks or brackets to hold the conductors far enough from the surface wired over to preserve the required electrical clearance.

All styles of these bushings for high voltage work properly designed to get the necessary insulation and mechanical strength can be furnished.

MINERALLAC ELECTRIC COMPANY

25 North Peoria Street Chicago, Illinois

Locked Rack Prevents Conduit Loss

An effective locked rack for the storage of conduit has been designed by a California contractor to prevent any removal of this material without the knowledge of the stockman. The rack is simply constructed with a few lengths of wood, fitted with pipe to form the shelves. It is designed so that the end at which it opens is accessible to the rear door of the stock room so that it need not be carried any distance to the waiting truck. Heavier conduit is kept on the bottom shelves and floor, the lighter material up above. The whole assortment is visible at all times, but cannot be removed except by the stockman who has the key to the padlock.

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tion, and that the contracts were in the nature of chattel mortgages. However, the Court held the contractor within his rights to remove the equipment for which the corporation was unable to pay, stating the law, as follows:

"A conditional sale is an agreement for the sale of a chattel, in which he vendee (corporation) undertakes to pay the price, and possession of the chattel is immediately given to the vendee (corporation) but the title to the same is retained by the vendor (contractor) until the purchase price is paid."

Therefore, it would be wise for contractors to adopt the above clause in their contracts to safeguard against losses.

Leo T. Parker

J. L. Hudson Company, Detroit, Michigan, where the electrical wiring is permanently protected by Youngstown Buckeye Conduit. Architect: Smith, Hinchman & Grylls. Electrical Contractors: John H. Busby Co. and McCleary-Harmon Company.

Conduit

that is

time-tried

and

service-tested

Youngstown Buckeye Conduit serviceability is a known quantity. It has a background of performance which gives eloquent testimony of its absolute dependability.

Building after building from coast to coast is demonstrating the fact that Youngstown Buckeye Conduit has all of the features that make for the utmost in conduit. It is tough and rigid—made of the finest grade of steel—yet it bends easily without danger to weld or enamel. It has a durable electro-galvanized or enamel coating, and it is exceptionally easy to thread.

Whether for service in power plants, factories, mills or any type of commercial building, Youngstown Buckeye Conduit gives the utmost assurance of a satisfactory installation. For that reason Youngstown Buckeye Conduit sales far exceed those of any other.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

General Offices—Youngstown, Ohio

DISTRICT SALES OFFICES

ATLANTA—Healey Bldg.
BOSTON—80 Federal St.
BUFFALO—Liberty Bank Bldg.
CHICAGO—Conway Bldg.
CINCINNATI—Union Trust Bldg.
CLEVELAND—Union Trust Bldg.
DALLAS—Magnolia Bldg.
DENVER—Continental Oil Bldg.
DETROIT—Fisher Bldg.
KANSAS CITY, MO.—Commerce Bldg.
MINNEAPOLIS—Andrus Bldg.
NEW ORLEANS—Hibernia Bldg.
NEW YORK—30 Church St.
PHILADELPHIA—Franklin Trust Bldg.
PITTSBURGH—Oliver Bldg.
SAN FRANCISCO—55 New Montgomery St.
SAVANNAH—M and M T Terminals
SEATTLE—Central Bldg.
ST. LOUIS—1501 Locust St.
YOUNGSTOWN—Stambaugh Bldg.

LONDON REPRESENTATIVE—The Youngstown Steel Products Co.
Dashwood House, Old Broad St., London, E. C. England

YOUNGSTOWN-BUCKEYE

CONDUIT

UMI

NEXT YEAR *You're Going* REAL

You're going to have a new tool in your kit pretty soon. . . . . .

Something you've been needing for years, but something you never could get hold of until now.

It's going to make all the difference in the world, to you, between "just getting by"—or actually going into the hole, and making real money in the electrical contracting business.

Seriously, you'd give a great deal of money for something, some tool or method of doing business, that would give you real, firm confidence in your business, replace uncertainty with assurance of profit, and start you toward the goal you've been seeing so far ahead of you all these years—namely, a profitable "going" business.

"SERVICE" is a word we hesitate to spring on you, because that much abused word has been made to cover so many imaginary items that it has fallen somewhat into disrepute.

Electrical Res

You'll want every issue of this magazine from now on . . . . . .

They will be filled with what John Wise calls m.m.i's, (money making ideas), of which the Resale Price Service is but one. But that is a big one, and as the prices change from time to time, or as items are taken off or added to the list this information is passed on to you without delay. Your latest list will be the correct one.

This matter has so much to do with the difference between real profits in your business and "ghost profits" that you simply can't afford to lose out. Better be sure your name is entered on our subscription lists for 1929.

To Make MONEY

But going back to its true meaning, there isn't a better word to describe what this magazine is about to furnish every subscriber beginning in January. Read on, and see if it isn't so. For years, contractors have been losing money on wiring jobs, because for one thing, they have had no real trustworthy information on what prices to put on material and devices used on a job. All a contractor knew about conduit, boxes, BX, fittings, etc. was what he paid his jobber for them. His profit, if any, was largely what he could make on his labor.

NOW he is going to be furnished with a suggested resale price schedule covering practically every construction item, which schedule if followed will permit him to make a wholesome profit. This resale price schedule will be revised monthly and will be printed in each issue in a form easily followed, and from then on pricing need no longer fall in the realm of guess work.

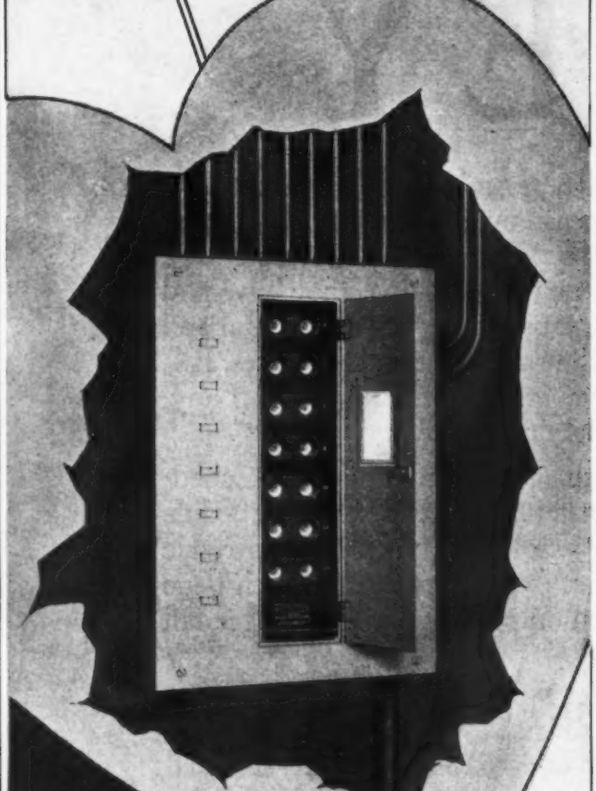
You think, now, (don't you?) that we are right in calling this

Contracting's ale Price "Service"

Beginning in January, then, plan to figure your estimates on a *new basis*—a *profit-making* basis.

UMI

A=S=E
The HEART of the WIRING SYSTEM
fuse-cabs!



The distribution center... in truth, the "Heart of the Wiring System" ...is permanent and trouble-free when A-S-E FUSE CABS are on the job..... Fuse-Cabs are offered in sizes ranging from two to twenty-four circuits...with and without provision for branch circuit switches...presenting a type for every standard installation.

ALL-STEEL-EQUIP COMPANY
Aurora, Ill.

Light and Power Rates

In a special serial report, the Rate Research Committee of the National Electric Light Association have prepared an analysis of light and power rates in the United States from data presented in the United States Census reports. Special reference is had to the relation between rates in private and municipally owned plants, to rates in Canadian provincially owned systems and to the relation between industrial and residential lighting rates.

* * *

Sign Maintenance Contract Schedule

Some electrical contractors are developing profitable business from sign maintenance on a contract basis. Among these, the Electric Sign Maintenance Co., of Boston, Mass., has developed a yearly contract for repairing, relamping and maintaining electric signs for a fixed monthly charge. The amount of work to be done is estimated and figured on a monthly basis, so that the customer knows exactly what he is to pay. Emergency calls are included in the contract price without extra cost. Lamps, color hoods, flasher parts, stock and labor for repairing corroded receptacles, broken wires, etc., are charged extra. The accompanying table shows the contract schedule of charges.

CONTRACT SCHEDULE FOR SIGN MAINTENANCE CHARGES

Lamp Formed Letter Signs

Type and Wattage	Monthly Charge Per Socket
10 Watt Mazda Clear	4 0c
15 Watt Mazda Daylight	6.5c
25 Watt Mazda Daylight	6.5c

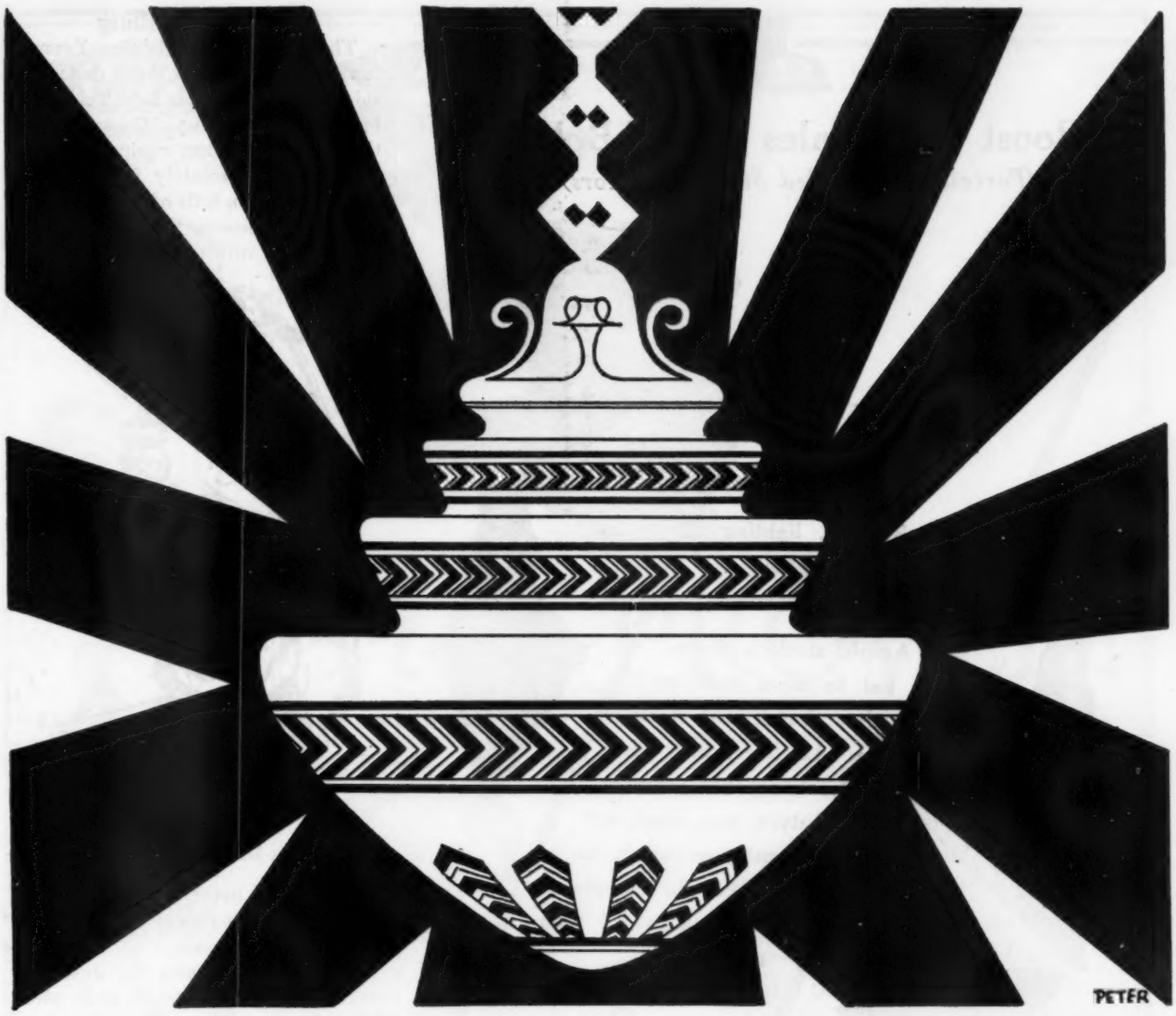
Panel Signs

Type and Wattage	Monthly Charge Per Socket
10 Watt Mazda Clear	8.8c
25 Watt Mazda Clear	8.8c
25 Watt Mazda Daylight	9.7c
50 Watt Mazda Daylight	9.7c

Glass Letter Signs

Height of Letters	Monthly Charge Per Letter
4″	6.2c
6″	7.6c
8″	10.5c
10″	12.0c
12″	12.0c
14″	12.2c
16″	12 3c
20″	14.0c
24″	16.1c

Type and Wattage	Monthly Charge Per Socket
40 Watt Mazda Clear	1.8c
50 Watt Mazda Daylight	3.1c
60 Watt Mazda Clear	2.0c
75 Watt Mazda Daylight	4.5c



Inland's "Art Moderne" Luminaire

Ideal For the Store Or Business

Now the store, office, theatre—in fact, business or institution of every description can "dress up" its lighting. The tendency towards modern decoration has opened the way for something different in illuminating glassware. Inland offers this distinctive new shape, with a touch of the modernistic, decorated in a variety of lively colors. Absolutely correct from the illuminating standpoint and far ahead in decorative value. Write for latest illustrated catalog.

INLAND GLASS WORKS, Inc.

6101 W. 65th Street Chicago, Illinois

Inland

THE LARGEST IN THE MIDDLE WEST

UMI

"Boost Your Sales with ABolites"

(Porcelain-Enameled Steel Reflectors)

RELIABILITY
Day by day, lighting hours—and lighting orders—are increasing.
Ample stock is essential to meet rush orders; but if that stock is ABolites, their interchangeable reflector feature sure does cut down your stock investment for complete coverage of your needs.
"Ask Your Jobber Salesman"

Write for Catalog No. 179

The ABolite Reflector Co.

2400 East 75th Street, Cleveland, O.

RELIABILITY

Dustless Drilling

The Carlson Electric Co., Youngstown, O., electragists, have done considerable work in the Bell Telephone buildings in that city. On account of the delicacy of the equipment, dust and dirt are absolutely forbidden.

E. C. Carlson tells of an interesting way of imprisoning the dust made by workmen in drilling holes in ceilings

No Dust Can Escape

and walls and preventing any particle of it from floating away to any of the boards and terminals.

The drawing shows the dust-trap and the manner in which it is used. The thing is nothing more or less than a felt wine-strainer put to a better (?) use. It is shaped like the crown of Tom Mix's two-gallon hat, and is about twelve ins. high. A metal rim is fastened to the opening, so it can be pressed flush against the ceiling.

The drill is inserted in a hole in the container, which can be held against the surface with one hand, the other working the drill. Before using, the inside of the felt is wet with water, making the dust cling and remain settled after the job is finished.

* * *

If Brides May Dream

Prof. V. L. Hollister

If brides may dream
Of a home serene,
And in fancy build a house,
Then bring to their aid
All plans well laid,
Even the Red Seal Plan.

Read before Lincoln (Neb.) Electric League.

Kwikon

TRADE MARK REGISTERED
A MARK OF QUALITY

5 to 1 PROVED!

As shown in the above illustration, Kwikon "No Bolt" Studs are free from any small nuts or bolts which are so easily fumbled and lost. There is just 1 nut to "spin up" in a jiffy, and the installation is complete—actually less than 1/5 the time formerly used in installing the old-fashioned studs.

875 electrical contractors wrote in during August, requesting sample Kwikon "No Bolt" Fixture Studs and proved to their own satisfaction that 5 Kwikon "No Bolt" Studs could be installed in the same length of time it takes to install 1 ordinary fixture stud.

Kwikon "No Bolt" Studs cost no more than ordinary studs, and have the advantage of being installed 5 times faster. Thus, they save time and earn profits for contractors using them.

There is no reason why you cannot use Kwikon "No Bolt" Studs on your next wiring job. Write today and let us send you sample, which will prove the value of using Kwikon "No Bolts," as it has been proved in August to 875 other electrical contractors.

The sample is free. Just write and it will be sent you by return mail.

S. R. FRALICK & COMPANY

15 So. Clinton St., Chicago, Ill.

SALES OFFICES:

BALTIMORE, MD.
113 E. Franklin St.

BOSTON, MASS.
120 Pearl Street

CINCINNATI, OHIO
223 East Third St.

CLEVELAND, OHIO
328 Chester-12th Bldg.

DENVER, COLORADO
1707 Sixteenth Street

DETROIT, MICH.
517 E. Woodbridge St.

KANSAS CITY, MO.
1644 Baltimore Ave.

LOS ANGELES, CALIF.
706 East Third St.

LOUISVILLE, KY.
212 Urban Bldg.

MINNEAPOLIS, MINN.
1017 Lumber Exchange Bldg.

PHILADELPHIA, PA.
2401 Chestnut St.

CANADIAN
W. H. Banfield & Sons, Ltd.
372 Pape Ave.
Toronto, Canada

NEW YORK, N. Y.
71 Murray St.

PITTSBURGH, PA.
405 Penn Ave., Crafts Bldg.

ST. LOUIS, MO.
1911 Pine Street

SAN FRANCISCO, CALIF.
1179 Market Street

"LATROBE" PRODUCTS

help to insure a Quality Job and our exclusive labor-saving features increase your profits. *Write for Prices.*

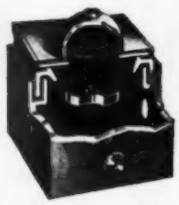
Sectional view of No. 300 Box illustrating installation in floor

No. 100 Box with No. 206 Nozzle

Cut-away view of No. 110 Box showing how the tapered unit receptacle fits tapered opening in top of box body

No. 120 Adjustable Floor Box with No. 206 Stem Nozzle

No. 130 Adjustable Floor Box with No. 207 Bell Nozzle illustrating No. 208 Unit Receptacle



No. 251 Square Adjustable Floor Box with No. 207 Bell Nozzle illustrating No. 208 Unit Receptacle

No. 625 Conduit Bender showing socket clamp

No. 285 Nozzle with two Duplex Receptacles. Mounted on No. 200 Cover Plate

Each coil packed in a strong carton

No. 400 No. 401 No. 402 No. 403

Malleable Iron Insulator Supports for securing Insulators to steel framework

WRITE FOR COMPLETE CATALOG
and a free copy of new 1928 National Electric Code

FULLMAN
Manufacturing Co.
LATROBE, PA.

99.9 Per Cent Collections

By MATT WHITNEY

President, Whitney Electric Co., Colorado Springs, Colo.

Collecting money is a simple job although it does take lots of time. In our company our bookkeeper is our credit manager who passes on all accounts and whose job it is if any accounts are doubtful to get the money.

All the buying public is accustomed to a thirty day billing, paying monthly. On the other hand, there are some people in every community who are negligent about paying. We therefore make it a practice to know the paying habits of our regular customers.

We have developed a series of four form letters to take care of slow-pay customers. Letter No. 1 goes to an account that is more than thirty days overdue. In other words, a July account not paid by the first of September would promptly receive this letter. Almost every time this letter brings in the money.

If there has been no response within ten days, Letter No. 2 is sent. Another ten days goes by before Letter No. 3 is sent and if it is a very desperate case, Letter No. 4 goes out.

Those who do not reply get a telephone call and a promise is secured from them as to the date they will pay. We find that this works because few people like to be reminded of a promise not kept.

No. 1

Dear Sir:—

A settlement of your account of..... amounting to ....., which you have doubtless overlooked, will be greatly appreciated.

No. 2

Dear Sir:—

We have had no response to our last letter requesting a settlement of your account of.....amounting to..... Kindly give this your immediate attention, and oblige.

No. 3

Dear Sir:—

You have entirely ignored our two previous requests for payment of your overdue account. We are consequently compelled to believe that you are purposely neglecting settlement.

We must now insist upon this account being paid by .....

No. 4

Dear Sir:—

We have made three requests for payment of the enclosed account. Each one you have ignored. The account is long past due, and yet you have not even given us a reason why you have delayed payment.

We cannot carry this any longer and unless it is paid by..... we shall without further notice, turn it over to our attorneys for collection.

Permaflector

Free Engineering Service

For Special Displays

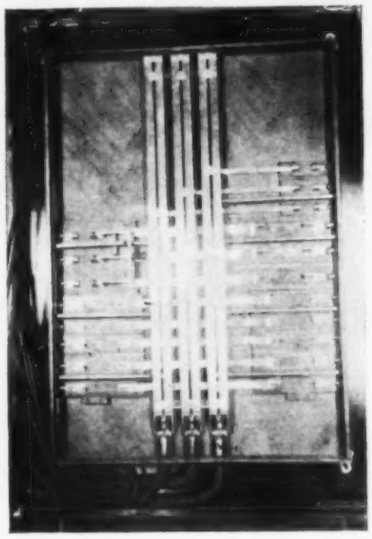
For your special displays this Permaflector Windo-Spot No. 200 is the thing. Takes 200-watt lamp. Every merchant needs at least one Windo-Spot—larger stores have use for several. Price of the No. 200, $10; with Colorlite, $12.50; portable base, $1.25 extra. All quotations F.O.B. Irwin, Pa.

"Pittsburgh" Permaflector

LET our engineering department study your show-window lighting problems and offer suggestions. No obligation on your part. Permaflector quality and service insure satisfaction for every merchant for whom you make installations. That means *more business for you.*

For twenty years we have specialized in show window and sales display lighting. All Permaflectors carry the 10-year guarantee, based upon an unequalled record of manufacturing excellence. In more than 12 years, less than one-thousandth of one per cent of our reflectors have been reported to us as having the backing tarnish or darken. That is mighty near perfect. Use that record to your own profit.

PITTSBURGH REFLECTOR COMPANY
304 Ross Street, Pittsburgh, Pa. *Representatives in 26 Leading Cities*



Note:—
in the upper right and left corners that space is provided for the installation of any future circuits from 10 *to* 200 *ampere capacity.*

A screwdriver—

is the only tool needed in making circuit changes on this panel!

With the LEXINGTON Convertible Distribution Panel the electrical contractor can alter the ampere capacity of the individual circuits from 10 ampere to 200 ampere, according to the load requirements, *with only a screwdriver as a tool.*

The individual circuits, being held in place by screws fitting in the bus bar slots, may be moved and rearranged vertically in a great number of positions—this is *true flexibility.*

THE LEXINGTON ELECTRIC PRODUCTS CO., Inc.

207 *E. 43rd Street* *New York, N. Y.*
12 *Chapel Street* *Newark, N. J.*

PANEL BOARDS—STEEL CABINETS—SWITCHBOARDS—SWITCHES

FUSITHERE Panel Boards were designed to facilitate installation in every possible way, as well as give the customer the best equipment for the purpose. Neat and compact, they have ample wire space. Flush boxes have adjustable plate. Panels are Copper bus bar type with accessible wire terminals, test holes and dead front. Various size knockouts on all sides and back.

CAT. L.F. 6

FUSITHERE PANELS
give you Everything *you can* Desire *in Panel Boards*

ELECTRIC APPARATUS CO.
702-706 N. Halsted St. Chicago

Full line of fuse panels and cabinets for any installation.

TRADE MARK
FUSITHERE
FUSE-IT-HERE

Industrial and theater switchboards. Stage foot and border lights.

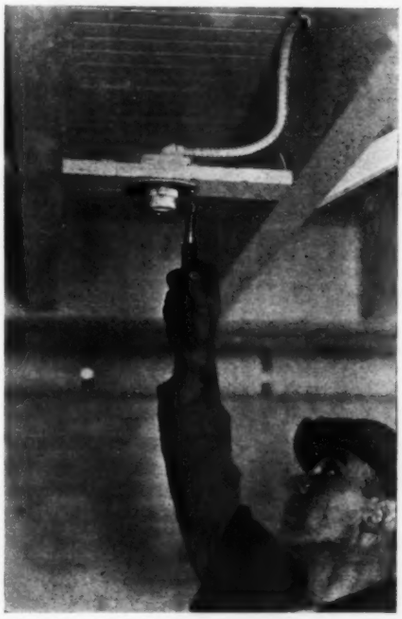
We tried to change our set of form letters and used a new No. 1 on six customers. They all paid; but three of them "bawled" me out for sending such a letter. Letter No. 1, as here shown, has brought in the money and many apologies for not having paid before and for that reason we are sticking to it.

These form letters are not printed forms which are filled in but are individual letters following the form with proper information filled in and then signed by myself.

We seldom make any personal calls or use collectors. However, after an account is overdue about 90 days and letters and other methods have apparently failed, we turn the account over to a lawyer for collection. This is almost always sufficient to bring in the money. We have had but one law suit and in that case the judgment was worthless.

We annually write off everything more than 90 days old. That amounts to about 1 per cent but we continue to

Neat Job on Basement Light



A basement light installed like this makes a neat job and permits the basement ceiling to be lathed and plastered at any time without additional electrical work.

A hole is cut in the backing, the size of the box, with a key-hole saw and the backing is set flush with the joists. Note the use of the L connector making a very neat exposed installation.

An increasingly important factor in electrical market development

How the WBB makes money for himself and helps everybody in the industry

THE electrical contractor who makes money makes it in two ways. First, he makes it by doing a good job of wiring at the least cost and a fair price, netting him a good profit.

Next, he makes money by getting more business—upon the strength of good work already done. Two kinds of business:

1. *More wiring business from the friends and acquaintances of customers pleased with wiring jobs.*
2. *Merchandise sales resulting from his contact with these pleased customers and their friends.*

Most electrical contractors find the use of Wiremold saves time and cost of installation, results in a better job of the work, pleases customers and paves the way to new business.

Hence the name "WBB"—"WIREMOLD BUSINESS BUILDER"!

Since the wiring job is the neck of the bottle through which must come all further sales of electrical merchandise and subsequent electrical service, consumption of electric current, the "WBB" therefore is a mighty factor in industry progress.

The fact that he is a "WBB" means he brings to his job and his function in the industry a kind and degree of intelligence which encourages and facilitates freer use of electrical conveniences on the part of the public.

It pays the electrical contractor to become a "WBB" because he thereby makes more money and builds more securely and permanently for the future.

And it pays every factor in the industry—jobbers, manufacturers, central stations—to promote the process because "WBB" success is all-industry success.

Copies of the WIREMOLD BUSINESS BUILDER, our monthly sales service, together with other literature descriptive of the Wiremold line and its sales possibilities, will be sent on request.

THE WIREMOLD COMPANY

MAIN OFFICE AND FACTORY, HARTFORD, CONN. DISTRIBUTORS IN ALL PARTS OF THE WORLD

Put "BELSON" on all your buying lists or index cards.

BELSON
BETTER LIGHTS

FLOODLIGHTS

for aviation fields, theatres, public buildings, for contractors on night-work jobs; for signs, advertising displays—for EVERY floodlighting purpose.

We offer these lights in
Cast aluminum, with Chromium Reflectors, when desired.
Spun aluminum, with our exclusive bayonet lock.
Spun copper—with bayonet lock.
Full range of sizes to accommodate lights from 200 to 1500 watts.
Improved designs, easy to install; quickly get-at-able for cleaning and for renewing globes. Cover a wide lighting area and are quickly adjusted and locked in any position. Give maximum lighting per unit of current. Last long. Your customers will come back for more.

On Theatre Lighting Jobs—get our prices

Floodlights Covelights Sign lights
Spotlights Louvrelights Exit signs
Footlights Border lights Cloud effects

Send blue prints for estimate. Also, talk to us about putting some of our quick-selling items into your retail stock.

BELSON MFG. CO.
808 Sibley Street, Chicago, U. S. A.

RELIANCE TIME SWITCHES

have been on the market for 19 years and are made in 12 different types to meet every purpose.

APPROVED AND GUARANTEED
HANDLED BY JOBBERS

We Also Make Racine Time Switches

A low priced machine that will meet the strongest competition.

Reliance Automatic Lighting Co.
1936 Mead Street RACINE, WISC.

make efforts to collect so that our losses from bad debts amount to about one tenth of one per cent a year.

We would just like to make one recommendation: If possible, make bills so clear that there will be no occasion for the customer to hold up in order to ask questions. This helps collections very materially.

* * *

Keeps Detailed Truck Costs

The Lighthouse Electric Company of Gary, Ind. maintains a close check-up on its automobiles and trucks and each month gets out a report covering gas, oil and all repairs and parts. Such a report for the first three months of the current year is here shown.

The company maintains a 1½ ton truck, a 1 ton truck and a roadster with open body, all Chevrolets. The policy of this company is to replace its trucks every two years.

Mr. A. B. Harris, president of the company, in reply to a question in regard to having trucking done by an outside corporation said:

"We have never seriously considered any other way of delivering than by our own trucks. Owing to the number of calls we make each day to all parts of the city we do not believe we could operate by having our trucking done."

Gas and Repair Report

	Name	Gas gal.	Oil qts.	Alcohol qts.	Repairs	
Jan.	Mr. L.	116	15	5		
Feb.	"	153	13			
Mar.	"	122	18			
Jan.	Mr. M.	60		6		
					1 tire rep.	$ 0.75
Feb.	"	57				
Mar.	"	107	3			
Jan.	Mr. S.	72	8	12		
Feb.	"	49	11	1		
					Rep. radiator	3.00
Mar.	"	94	10			
					3 tire rep.	1.65
Jan.	Mr. V.	6				
Feb.	"	84	1½	6		
					Spark plug	.60
Mar.	"	68	4			
Jan.	Shop	9				
Truck No. 1 Mileage						
Jan.	308	72	8	9		
					7 tire rep.	5.20
Feb.	329	71	7			
					Parts	18.65
Mar.	326	104	6			
					Grantham bill	31.70
					Towing	7.50
Truck No. 2						
Jan.	140	85	6	6		
					15 tire rep.	11.45
Feb.	92	143	6	4		
					Parts and supplies	16.80
Mar.	106	134	15			
					Grantham bill	42.85
					Towing	7.50
Truck No. 3						
Jan.		36	4	10		
					Oil filtered	3.25
Feb.		40	5			
					New tube	2.00
Mar.		47			Supplies	1.30

400 lives depend on these transformers!

ALMOST in the shadow of the famous Brooklyn Bridge are shafts that lead down to where busy workmen are pushing a $23,000,000 tunnel through the oozing bed of the East River.

400 human beings depend every minute on air from the surface. Every precaution against power interruption to the electrically driven compressors has been taken. Three separate sources of power are provided on each side of the river by the power companies.

Packard Transformers step down this power to the voltage of the compressor motors.

Life-and-death affairs demand dependability..... and Packard Transformers were therefore chosen.

AMERICAN BROWN BOVERI ELECTRIC CORPORATION

Offices in 37 Principal Cities *Main Plant Camden, N. J.*

Mason & Hanger Co. Inc., Contractors, have a total of 54 months to complete the new Fulton Street Tunnel for the Board of Transportation, City of New York. The United Electric Light & Power Co. of New York and Brooklyn Edison Co. are supplying power for simultaneous work at either end.

Electrically-driven units include high and low pressure compressors as well as hydraulic pumps of 6000 pounds pressure. PACKARD TRANSFORMERS used are as follows:

Three 2500 KVA., 3 phase, 7800/13800—2300 volt units, complete with external tap changers.

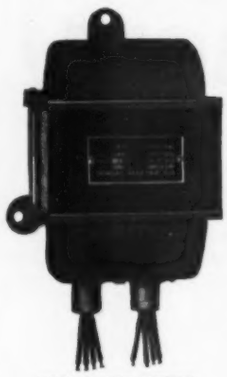
Six 200 KVA., single phase, 60 cycle, 2300—115/230 volt units.

One 500 KVA., 3 phase, 60 cycle, 4600—2300 volt auto transformer.

TRANSFORMERS

PACKARD *and* A-A-B TRANSFORMERS *together fill every Transformer need*

NEW CODE TRANSFORMERS
with CONDUIT CONNECTIONS



MADE IN SIZES
¼ to 50 K. V. A.
INCLUSIVE
SINGLE PHASE
TWO PHASE and
THREE PHASE.

according to the
new 1928 National Code
balance coils are not permitted to supply lighting and appliance circuits.

SORGEL AIR COOLED TRANSFORMERS

meet all requirements of the new code.

Transformers designed for Special Applications.

Send for Descriptive Literature

SORGEL ELECTRIC CO.

Clybourne and West Water Sts. MILWAUKEE, WIS.

More Speed—Less Work!

EVERY job in quicker time! Easiest fishing you ever knew. And complete thread protection; 3-lug metal cap cushioned with fibre—protects entire thread. Pittsburgh Standard Conduit reaches the job ready to install.

Enameled Metals Company
PITTSBURGH, PA.

How Does Your Business Stack Up?

(Continued from page 9)

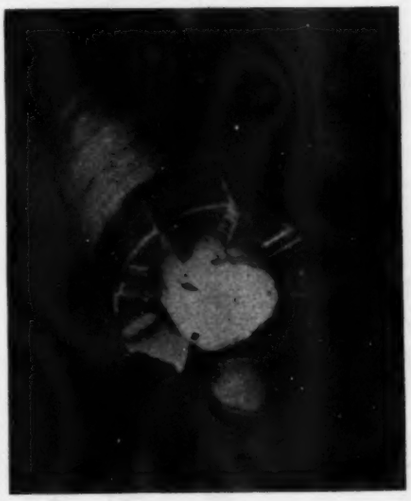
commitments were not taken care of if the accounts receivable were too high. Such is the fact as shown.

Analysis of Standard

WORKING CAPITAL: A three-to-one ratio of current assets to current liabilities has been adopted, notwithstanding customary two-to-one credit ratios, in view of the type of operation, and because of the extended periods during which capital may be tied up in uncompleted work, inventories, and receivables.

INVENTORIES: In the standards set for the association, a more liberal allowance has been made for work-in-process and material inventory than would seem to be warranted by the average or actual figures of members. This was purposely done, and is to be coupled with the suggestion that the practice now followed by a considerable proportion of reporting members in treating progress payments (or billings) as sales, be discontinued, except in extraordinary instances.

It was recommended that costs be assembled in a job cost or work-in-process account; that progress payments, or billings, be credited to a



Drills Smooth Hole in Concrete:— A new machine tool material known as "Carboloy" has been announced by the General Electric Company. This new alloy is claimed to be harder and to have longer life than any previously known machine tool metal. Among other uses claimed for it is concrete drilling in place of star hammers, securing thereby a comparatively smooth hole.

In the new HOTEL VICTORIA NEW YORK

CENTRAL CONDUIT

At 51st Street and Seventh Avenue another architectural masterpiece has been added to New York City's wonderful skyline—the New Hotel Victoria—designed and supervised by Swartz and Gross, Architects for the Max Kurzrok Associates, Inc. Englert-Hellman, Inc. were the electrical contractors.

This is one of the many prominent New York buildings equipped with Central Black Conduit and indicates the preference "Central" Conduit enjoys among the leading builders and electrical contractors everywhere.

CENTRAL WHITE
WHITENRED
CENTRAL BLACK

CENTRAL TUBE COMPANY
PITTSBURGH

THE ANSONIA ELECTRICAL CO.

A NEW DOUBLE COIL BELL No. 657

Stamped Steel Cover and Base

An Unusually Excellent Bell at a Very Low Price

WRITE

Supplied in gray enamel only.

Write for this 64-page catalog E which shows a complete line of Annunciators, Bells, Push Buttons and other electrical house goods.

THE ANSONIA ELECTRICAL CO.
ANSONIA, CONN.

ANNUNCIATORS — BELLS
BUZZERS—PUSH BUTTONS

ELECTRICAL HOUSE GOODS

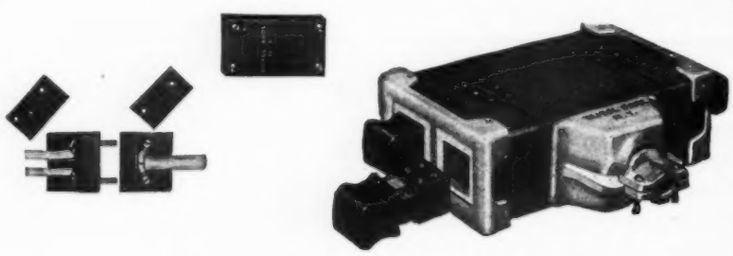
progress payments, or advance billings account, and that upon final completion of each job, the advance billings be transferred to sales, and the work-in-process or job cost account to cost of sales. In this manner profits or losses shown by financial statements will be actual, rather than estimated, as at present.

Income Taxes

Incidentally, following the foregoing suggestion will mean that Federal income taxes will be paid on actual operating results after the member is certain of the absolute accuracy of such results.

The exception to the foregoing would be in instances of the larger contracts only, completion of which will be spread over two or more accounting periods. In these cases, it may be advisable to take up on the books proportionate apparent profits on the contract.

DEBT TO NET WORTH RATIO: A relatively high ratio of net worth to total debt (sixty-five to thirty-five) has been established, for reasons similar to those enumerated in the paragraphs dealing with working capital ratios.



Pin and Plug Connectors

Save Time for Electrical Contractors

TEMPORARY circuits for lights, motors, electrical tools, and other devices can be made quickly and conveniently with Kliegl Pin-plug Connectors and Plugging Boxes—saving time and expense. They are available in a range of sizes from 5- to 100-amperes—any combination desired. Other Kliegl specialties are:

Footlights	Floodlights	Exit Signs
Borderlights	Spotlights	Carriage Calls
Stage Floor Pockets	Cove Lights	Panel Pockets
Wall Pockets	Aisle Lights	Dimmers

for Descriptive Literature write

KLIEGL BROS
UNIVERSAL ELECTRIC STAGE LIGHTING CO., INC.
321 WEST 50th STREET
NEW YORK, N.Y.

Out of Way Location for Bake Oven

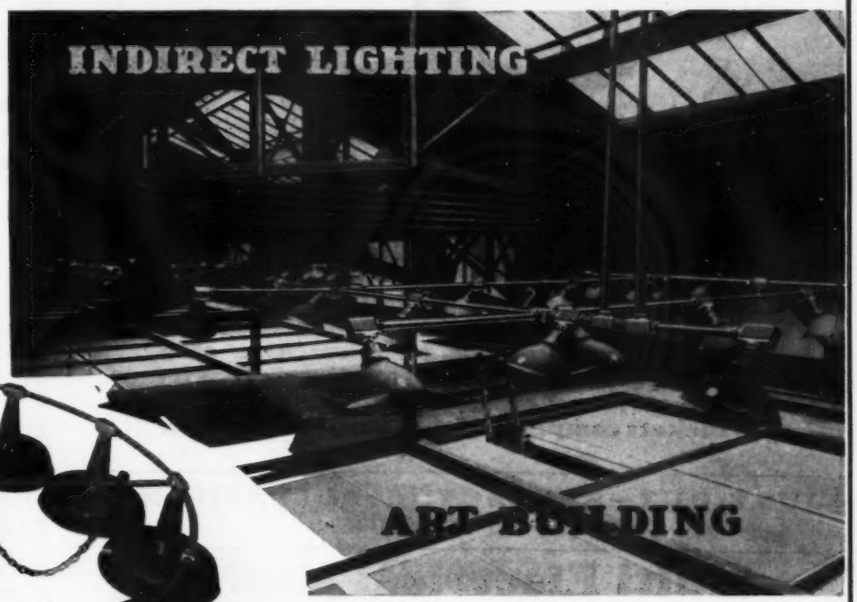
By placing this small oven under the bench it is out of the way and in such a location that the workman can watch the armatures being baked without leaving his other work. The oven is constructed of angle iron covered with sheet iron. The heat is provided by a small gas burner which is covered by a piece of sheet metal in the bottom of the furnace.

KONDU-BOX

REGISTERED IN U. S. PATENT OFFICE AND FOREIGN COUNTRIES

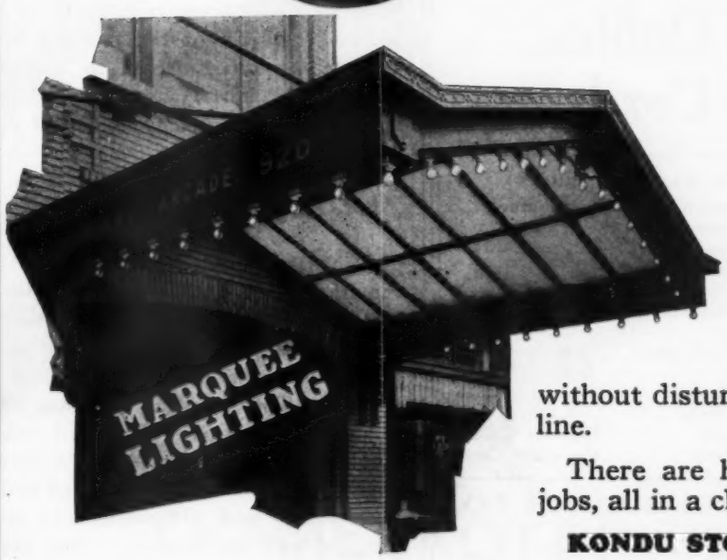
These Jobs

are rigid, too, in spite of the fact that the lighting units are heavy and solely supported by the KONDU THREADLESS FITTINGS themselves.



FIGHT ARENA

"STAYS PUT"



The Problem—

How to obtain even lighting through the diffused glass ceiling for art displays?

The Answer—

They used KONDU.

Why?

When the boxes are once placed they stay put, and yet any KONDU-BOX can be removed without disturbing other parts of the completed line.

There are hundreds more of such KONDU jobs, all in a class by themselves.

KONDU STOCKED BY LEADING JOBBERS

Erie Malleable Iron Company

Kondu Division OFFICES IN PRINCIPAL CITIES **Erie, Pa.**

MULTI

REFLECTORS

Of porcelain enameled Steel. In all standard types and sizes. White enameled coating makes for perfect illumination. Proof against rust, dust, vapor or smoke fumes, atmospheric changes. One of a wide variety of practical electrical wiring devices. Special feature: reflector sockets complete with adjustable sockets.

JUST OUT—REFLECTOR BULLETIN No. 6
Send for it now

Multi Electrical Mfg. Co.
210 No. Ogden Ave., Chicago, Ill.

MARION

Wires, and *Cables Cords*

The highest standard in rubber and varnish cambric insulated wires, cables and cords characterizes the MARION line, as symbolized by the eagle trademark. Our chief items are Lead Covered Parkway and High Voltage Cables, but a full line of common types is available for immediate shipment. This includes Rubber Covered (solid or stranded) Conductor, Non-metallic Sheathed Cable, Lamp Cords, Reinforced Cords, Security flex all Rubber Cord, and Telephone Wires. Special wires to order.

The line also includes:

- Weatherproof Wires
- Annunciator Wires
- Switchboard Cables
- Locomotive Cables
- Automobile Cables
- Mining Machine Cables
- Varnished Cambric Cables
- Fixture Cords
- Heater Cords
- Nitro Cords
- Office Wires
- Flame-proof Cables
- Pothead Wires
- Stove Wires
- Stage Cables
- Packing House Cables
- Brewery Cords
- Deck Cables
- Border Light Cables
- Elevator Cables
- Canvasite Cords

MARION INSULATED WIRE AND RUBBER CO.
Factory, Marion, Ind.

Chicago Office & Warehouse: 213-15 No. Desplaines Street.

Salt Lake City, No. 4 Interurban Bldg.
Dallas, 912 Commerce St.
Portland, Oregon, 355 Everett St.
Los Angeles, 324 N. San Pedro St.
Buffalo, N. Y., 395 Ellicott Square
San Francisco Office, 274 Brannon Street
Atlanta, Georgia, 515 Peters Bldg.
Indianapolis, Odd Fellows Bldg.
Seattle, 95 Connecticut St.
New York, 171 Madison Avenue

Grub Up The Root of The Evil

A big electrical contractor, who has no illusions about himself or anyone else was talking "Cold Turkey" to a group of his competitors.

"When a man has an ailment for which there is no apparent cause," he said, "the doctor immediately starts hunting around his carcass for a hidden concentration of poison. When he finds it he tells the patient that when said poison-spot is removed, he will be sound again.

"Now, that doctor can be the smartest in the world, both as to finding the cause of the trouble and proving to the man that it exists right in the place where he found it. But unless the patient carries out his part of the treatment, Doc might as well have stayed at the office.

"Let us say that our National Association is the doctor and we are the patients—I mean our local group of contractors. Doc has found our poison concentrations by much research and investigation. He tells us we are not getting enough for our work because we are figuring on a wrong basis and because we haven't the correct idea of assets, liabilities, overhead, etc. And we know he's telling the truth.

"Now, let me tell you, all the associations and education in the world will never bring us to better business and right profits until every last one of us cleans his house from the ground up and gets rid of the pus sac by definite, continued *action,* no matter how much it hurts. Local legislation helps a lot, but as long as any of us take advantage of the loopholes, the whole crowd is at a standstill."

* * *

Thanks!

"Do not let careless or thoughtless remarks influence you in regard to the electrical trade magazines. These publications are of importance to every man who aspires to business success. They are the mediums of industry expression. They tell *you* what the *other fellow thinks and does.* Read your trade magazines and know your world! If you miss an issue just call the League. They are here on file. We subscribe to them at regular rates; and get no rake off; but we can't afford to be without them. Which is your case exactly."—Metropolitan Electric League, Boston, Mass.

SUPER-QUALITY Rigid Conduit Pipe *for* *Easy Cut, Threads and Bends*

GALVAKOTE

Exterior wall and threads heavily, uniformly and firmly coated with pure zinc. Interior wall smooth, entirely and evenly coated with best quality black glossy enamel, properly baked to be hard, smooth and flexible in any temperature.

ENAMELKOTE

Exterior and interior walls evenly coated with best quality black glossy enamel, baked to be smooth, flexible and unsticky in any temperature.

Both brands made of special soft steel perfectly welded and threaded.

And the SEALTIGHT *Thread Protector*

New and extraordinary. So applied as to be air and water tight. Stays on until purposely removed. Quickly done with pliers, knife or any tool that will grip with thumb the shearing clip.

Manufactured by

Clayton Mark & Co.

CHICAGO, ILL.

Distributed by Leading Jobbers

UMI

Manufacturers News

Sets Up Committee to Keep Abreast of Field Demands

In order to keep abreast of developments throughout the field of wiring practice and thereby keep its line complete, the Wiremold Company has encouraged the practice of holding every now and then a meeting of certain of its territorial representatives and the managers of its two factories. These men comprise what the company calls its "Standards Committee," whose job it is to keep the Wiremold line abreast of field demands. The latest meeting of this committee was held on September 28 at the company's general office at Hartford, Conn., where there were in attendance, Messrs. Rutherford and Birckmayer, the two factory managers and the following territorial representatives: Rigby, New England; Love, Pittsburgh; Beckett, Philadelphia; and Sundstrom, New York City.

* * *

Westinghouse Reorganizes Brooklyn Plant

A change in organization has been announced by the Westinghouse Electric and Manufacturing Company whereby theater switchboards and panelboards are being consolidated into one section. The sales, engineering, and manufacturing headquarters of the new panelboard and theater switchboard division will be in Brooklyn, New York. R. F. Frenger, former automatic switching section head, has been named as sales head of the new division. J. L. Wagoner, formerly panelboard specialist in the Pittsburgh office, has been appointed as head inquiry man.

Mr. Frenger was born and received his early education in St. Louis, Mo. Later he attended the State College of New Mexico, and was graduated from that institution in 1915, with the degree of B. S. in Mechanical Engineering. The same year he started to work for Westinghouse on the graduate student course which led to his entering the field of switchboard sales, later going to the Chicago office as switchboard specialist.

During the war, Mr. Frenger served with the Naval Air Corps. Upon his discharge from the service in 1919, he reentered the employ of the Westinghouse Company as a central station salesman in the Chicago and Minneapolis offices.

In the early part of 1920, he was employed by the Bascam-French Company of Las Cruces, New Mexico, but, after a brief period, he returned to the switchboard sales department of the Westinghouse Company. He became automatic switching section head in this department, which position he held until his recent promotion.

* * *

Appleton's Twenty-fifth Anniversary

The Appleton Electric Company is celebrating its twenty-fifth anniversary. In 1903, when the business was commenced by Albert Ivor Appleton, the original factory in West Washington St. occupied only five hundred square feet of floor space, and used the services of only two employees.

A. I. Appleton

At the beginning, the modest catalog of the firm included only such things as telephone fuses, tubular fuses, tubular line fuses, telephone fuse blocks, distributing boards, connectors, cable hangers, magnet winders, test connectors, paper sleeves, Appleton tested fuse wire, fuse strip and fuse links, and other interesting specialties which are still handled by the company. Today the company is known largely for its conduit fittings.

Other electrical conduit fittings made by this company are laundry fittings, conduit hangers, conduit clamps, outlet boxes and covers, locknuts and bushings, bar hangers and bar sets, also miscellaneous small conduit fittings such as fixture stems, etc., in addition this company also makes the well known Reelite.

In 1921 a new building was erected at 1701 Wellington Ave., containing 146,000 sq. ft. of floor space and in 1926 an addition was erected containing 100,000 sq. ft. of floor space. Approximately 400 men and women are employed in the factory at Chicago.

In addition, the company recently acquired a foundry at South Milwaukee, Wis., where several new buildings have been erected. About 100 people are employed at the foundry.

Branch offices are maintained in New York City, Los Angeles, San Francisco and Seattle and at which outlet warehouse stock of all products are carried.

* * *

Wire Manufacturers Meet

Forty wire and cable manufacturers were represented at a meeting of the wire and cable section of the National Electrical Manufacturers Association at the Westchester Biltmore Country Club, Rye, N. Y., on September 19, at what was perhaps the most thoroughly representative meeting ever held in the wire and cable manufacturing industry.

As originally organized, the wire and cable section included only the rubber covered group. The scope of the section, which was greatly enlarged at the meeting, is now divided into the five working groups of bare and waterproof, flexible cord, magnet wire, power cable and rubber covered wire.

H. Donn Keresey, general sales manager of the Anaconda Copper Mining Company, was elected permanent chairman of the enlarged wire and cable section. W. E. Sprackling, vice-president, Supply Division,

NEMA, and president of the Tubular Woven Fabric Company, was named vice-chairman of the section.

Group chairmen were elected as follows:

Bare and weatherproof group—Wylie Brown, president, American Copper Products Company.

Flexible cord group—David S. Davis, president, Davis-Jones Insulated Wire Company.

Magnet wire group—F. L. Meeske, president, Maring Wire Company.

Power cable group—D. R. G. Palmer, president, Safety Cable Company Division of the General Cable Corporation.

Rubber covered wire group—C. E. Wilson, assistant to vice-president, General Electric Company.

* * *

Olsen Joins George Richards & Company

John R. Olsen, formerly Vice President in charge of railway sales for the Central States General Electric Supply Corp., has joined George

John R. Olsen

Richards & Company, manufacturers and manufacturers' representatives. This company represents American Circular Loom Company, Atlantic Insulated Wire & Cable Company and the Wirt Company, in addition to which they manufacture Bell-Ringing Transformers and "Ground-Tite" Fixture Hangers.

* * *

H. A. Framburg & Company, Chicago, Illinois, are distributing a new twenty-eight page catalog showing their line of medium, low and high priced residential lighting fixtures, including outdoor lanterns.

Another reason for DUTCH BRAND FRICTION TAPE *Leadership!*

Frayless

No. 4 of a series of ads on "Why You Should Use and Sell Dutch Brand Friction Tape"

Frayless tape means economy. No waste and no time-losing annoyance. When ordinary tape is used all that is saved in price, is thrown away in frayed and raveling pieces and wasted time—and you still have ordinary tape.

Every inch of every roll of DUTCH BRAND Friction Tape is usable. It is perfectly cut and free from raveling. Our special cutting equipment assures a clean edge—always.

Non-raveling is just another reason why DUTCH BRAND Friction Tape is known as the "Extra-Service" product. By "Extra-Service" is meant a tape which exceeds the rigid specifications of The American Society for Testing Materials, Government agencies and large electrical corporations.

DUTCH BRAND also possesses greater insulating properties, has longer life, added strength and adhesion. Such a tape is economical.

We invite you to write us for a free test sample.

Jobbers everywhere carry DUTCH BRAND Friction Tape. Available in three color Counter Displays for retail selling.

VAN CLEEF BROS. *Established 1910*

Manufacturers Friction and Rubber Tape

Woodlawn Ave., 77th to 78th Sts., Chicago, U. S. A.

ANOTHER PERFECT INSULATOR!

DUTCH BRAND Rubber Splicing Compound will resist up to 25,000 volts thru a single thickness. It fuses perfectly too.

Ovalduct in Office Wiring

A booklet showing how to lay out the room wiring for office buildings to provide flexibility by using Ovalduct has been prepared by C. A. Carpenter, electrical engineer for Graham, Anderson, Probst and White, architects. The booklet, which is issued by the manufacturers of the product, National Electrical Products Corporation, Pittsburgh, Pa., is written solely from the installation angle and offers practical help to contractors.

* * *

Fishback Heads Apparatus Division, N. E. M. A.

F. R. Fishback, president of the Electric Controller & Manufacturing Company, Cleveland, O., has just been elected vice president in charge of the apparatus division of the National Electrical Manufacturers Association, succeeding N. A. Wolcott, resigned. Mr. Fishback's business experience with the Electric Controller & Manufacturing Company has been on the commercial side. He has held the position of sales manager and in 1924 was appointed vice president and secretary. The following year he was elected president.

As vice president of the Apparatus Division of N.E.M.A., Mr. Fishback will represent a group which includes about 85 per cent of all the manufacturers of electrical apparatus and machinery in the country.

* * *

Brings Out Elevator Device Line

The Maintenance Company, Inc., contracting electrical and elevator engineers, 449 West 42 Street, New York, N. Y., is now offering to the trade a line of devices for the maintenance, repair and improvement of elevator equipments which it had originally developed for its own use.

The Maintenance Company has been engaged in the maintenance of electric elevators, their controllers, safety devices and other accessories since 1897. Because of difficulties met with in other devices the company designed and manufactured its own line for its own use.

The line, which includes elevator controllers, car switches, magnet brakes, stop motor device, machine limit, start cable switch, combination bar lock and contact, door switch, emergency switch, hoist-way limit switch, car safety switch, swinging and rotary pilot switches, overspeed safety governor, governor cable tension weight and releasing carrier, are now offered generally to the trade for the first time.

* * *

New Chief Engineer for Cutler-Hammer

Appointment of N. L. Mortenson as chief engineer for The Cutler-Hammer Mfg. Co., Milwaukee, has been announced effective September 1.

Mr. T. E. Barnum, former chief

N. L. Mortenson

engineer, has been appointed consulting engineer for the company, in which position he will be able to give uninterrupted attention to engineering problems and outside engineering relations.

Mr. Mortenson has been connected with Cutler-Hammer for 21 years, the last five of which have been as assistant to Mr. Barnum.

* * *

Secures Contract for 15,000 Fixtures

What is believed to be the world's largest single order for interior fixtures was recently placed with the Westinghouse Electric and Manufacturing Company by the new Fisher Building in Detroit now rapidly nearing completion. The number of Westinghouse units required for the building will be approximately 15,000, of which the initial order, just placed, to be used in the first section of the building now nearing completion amounts to 4500, costing $40,000.

The fixture consists of a new octagonal casing type holder with an applied die cast ornament.

Ninety-Six Colleges Represented

This year 3500 college seniors were interviewed by several Westinghouse Educational representatives and 1900 applied for the Graduate Student Course. Of the total number of applicants 260 men were accepted for the course offered.

The men enrolled this year by the Westinghouse Electric and Manufacturing Company in the graduate student course represent ninety-six colleges in forty-three of the forty-eight states of the country. Out of the 260 students taken, only 12 were in the lower half of their classes scholastically. The men after a short time on the course have segregated into various branches; ninety have chosen Engineering, one hundred have selected Sales, fifteen have chosen Works Management, and the remainder have gone into the Operating course in mind of going with a public utility or industrial company upon completion of the course.

For the forty-two years of the company's existence, it has been its policy to take college graduates for the Graduate Course. Over 8000 men have been enrolled in the student course since the company adopted this policy. Many of the leading sales, engineering, manufacturing executives of the company entered the employ of the Westinghouse as students on graduation from college.

The company has issued a booklet outlining its educational policies as related to college trained men, and those interested may have it by addressing the company at its East Pittsburgh headquarters.

* * *

Ely Goes to New England

Robert B. Ely has been appointed street lighting specialist, attached to the Boston office of the Westinghouse Electric & Manufacturing Company. Mr. Ely was engaged in illuminating engineering and commercial sales work for the Philadelphia Electric Company for seventeen years, and was employed by the Westinghouse Lamp Company in New York for ten years as manager of the sales promotion department. During this period he prepared an instruction course for salesmen, and was active in lighting and exhibits and jobbers' meetings and the instruction of salesmen in lamp engineering and sales.

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